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On and About our Roads.

WINTER has brought us its usual train of street miseries. To judge from the posting of two traffic-takers on Waterloo Bridge, the municipal authorities are about to propose some alteration in our streets. Most likely, indeed, the energies of the City Fathers are chiefly directed to the task of making the southern entrance to their dominion follow the example of the western, by toppling down London Bridge as well as Temple Bar. The result, however, on the traffic will be obviously different in the two cases. A more uninterrupted entrance will be afforded from the line of the Strand, through the area on which the tower of the New Law Courts already casts a portentous frown. But the only persons who will be benefited by the throwing more weight on the exactly-balanced piles of Rennie's closely-calculated foundations, will be the proprietors of the two neighbouring railway bridges, for whom the City authorities (so that Parliament permits) are preparing a lucrative God-send. It ought to be unnecessary, and we fear that it will be useless, in this year of confusion of councils, to call attention anew to the fact that the Southwark abutment of London Bridge was on the move under the very eye of its engineer, as will be found duly detailed in his biography; that it only stopped after the level of the masonry had been seriously disturbed; that the deepening of the river since 1830 must have tended rather to diminish than to increase the stability of the piles; and that if more weight be thrown on the area of the present foundations, there is very good reason to fear a catastrophe. This, however, is beside the point to which we now desire to call the attention of our readers,—a point from which our own thoughts have been for the moment diverted by the vision of those two menacing individuals, armed each with a pocket-book, shivering in the river fog.

For more years past than we care to count, the winter discomforts natural to the streets of a city have been aggravated in London by the conduct of those responsible for the maintenance of the roads. It is true that, under our present system (or, rather, abuse of system) the repair or relaying of a street that conveys a heavy traffic is a grievous inconvenience happen when it may. Still, it has so often occurred as almost to be looked upon as a normal state of things that it is just when Parliament meets, or when some special circumstance attracts an unusual number of visitors to London, that the most wide and thorough revision of the chief roadways has been taken in hand. Nor is it to be expected that the time-honoured independence of different dignitaries, which usually leads the gas-people to lift their mains about a week after a line of street has been newly paved, and the water-company to take up the stones as soon as the gas-folk have retired, will fail to be honoured, in the breach of viability rather than in the observance of public convenience, in the dark months of early 1878.

Notwithstanding the enormous amount of traffic which the Metropolitan and Metropolitan District Railways have taken off the streets, the pressure on the roadway system of London is more severe than any with which it can be compared. Nor is this all. That pressure is constantly increasing, and is likely to increase, with that normal increase of the population of the metropolis which has been found to be at a rate which doubles in forty years. As a general rule, in England, our improvements are partial, unconnected, and made by rule of thumb. It is probable that a very large amount of time, money, and vexation would be spared if we could impart a little of that German phlegm which enables our Northern cousins to study in silence, for the lifetime of two or three generations, the main problems of social life, and then to astonish the world by a quiet and irresistible conversion of the result of their meditations into concrete form. Nor, if we took a leaf from our French neighbours, and laid down primary conditions, from which are to be deduced general laws, and later, individual applications of these laws, might it prove altogether undesirable. That, however, is by the bye. We call ourselves a practical people. The truth is that we are apt to consider time spent in taking counsel, without in the meanwhile putting our hands to any work, to be lost. We must be doing,—doing something,—rather than waiting to learn what is the best thing to do. It cannot be denied that in this way we collect a vast amount of experience, positive as well as negative; nor is the latter kind of experience to be despised. It is, of course, better to ascertain a successful application of some new method than to prove its failure. But the failure is, in itself, instructive; and its due record may prevent dozens and hundreds of inventors from wasting their brain-power in following the same tempting path, which ends unfortunately in swamp.

It must be regarded as a striking instance of the manner in which public and permanent information of great value is to be derived from the efforts of individuals, or associations of individuals to carry out their own mercantile operations, that on the 1st of February, 1877, there were no fewer than fifty-seven separate portions of asphalte pavement, and fifty-four separate portions of wood pavement, laid in the City of London alone. Of each of these Mr. Haywood, the engineer and surveyor to the Commissioners of Sewers, has recorded the position, area in yards, date of laying, system on which laid, repairs done since it was new laid, and present condition. It is not our present object to discuss in detail this excellent report, or to pronounce an opinion between the different competitors for public favour, especially those who may be thought to run a neck-and-neck race. Our wish is rather to regard the subject in block; to divide it into intelligible chapters; and to ascertain what light may thus be cast on the important question,—"What kind of paving is, all things considered, the best for the streets of London?"

The street mileage of London, exclusive of the City, and of extra parochial districts, is given by Mr. Firth, in his bulky volumne on "Municipal London," at 1,410 miles. The rateable value of the property thus accommodated was, in 1873, nearly 18,000,000*l.* sterling. The area in statute acres is 75,490. The number of inhabited houses, in 1871, was 419,642. These latter totals, however, include the City acreage of 650 acres, and the number of 9,236 inhabited houses in the City. The rateable value of these was, in 1871, 2,530,868*l.*; giving a total rateable value for London of 20,509,437. The paving expenditure (still exclusive of the City), for the years from 1856 to 1875, was 3,038,406; or in round numbers 300,000*l.* per annum. The cost of sewers, sanitary, and other improvements during the same period, was 6,067,228*l.*, or about double the paving expenditure. The street mileage of the City is not given by Mr. Firth; but in 1866 Mr. Heywood reported that there existed fifty miles of public way, of which the carriageway area amounted to 390,260 square yards, the footway to 309,018, and thus the total area to 699,278 superficial yards, which is equal to 144·4 acres, or to nearly one-fourth (actually ·221) of the total area of the City. We thus attain a total street mileage of 1,460 miles for the metropolis, a figure which, in the more sparsely-peopled districts, will hereafter be somewhat augmented. Exclusive of the City, London pays rather more than 27s. per yard run per annum for the maintenance of her roads and streets.

It may be convenient here to recall the following facts:—The greater London of the Registrar-General contained, in 1876, 4,250,000 souls, in round numbers; it covered an area of 698 square miles. The incidence of local taxation per head on the population was 50s. per annum. Out of that every Londoner paid as follows:—For gas, 17s. 3d.; for water, 6s. 6d.; for poor-rate, 9s. 3d.; for local district board-rates, 7s. 8d.; for metropolitan police, 7s. 8d.; for corporation and commissioners of sewers for the City, 1s. 3d.; for Metropolitan Board of Works, 2s.; for coal and wine dues, 1s. 8d.; and for the London School Board, 7d. This

rateable division, per head of the population, of the large sum of 8,645,863*l.*, which, in 1874, was levied by the rates of the metropolis, will be of value as an index when any increase is proposed as to either of the items which go to make up the annual charge.

It may further be remarked, with reference to that cleansing of the streets to which we have to call attention, that while the average outflow from the metropolitan sewers is 628,000 metric tons per diem, the outflow in a wet day is raised to 897,000 metric tons. At the same time, it has been calculated that of the water sent in to London by the water companies, amounting to 520,000 metric tons per diem, 18,000 have escaped by evaporation or surface drainage into the rivers. The capacity of the drainage works, owing to their being constructed to carry off the rainfall as well as the regular water-supply, is 55 per cent. more than would otherwise have been requisite, and the weekly cost of the pumping exceeds by 23 per cent. what would otherwise have been required.

The cost of maintaining the various descriptions of pavements, which has hitherto been too often regarded as the sole question by the authorities, is, of course, the first which requires examination. From the recently-published volume on "Roads and Streets," by Messrs. Law & Clark, we learn that the highest annual cost of a macadamised street has amounted (in Piccadilly, 1870) to as much as from 3d. and 6d. to 4s. per square yard. Over an average of eight portions of heavily-traversed roadway, comprising Parliament-street, Bridge-street Westminster, Regent-street, and Piccadilly, between 1854 and 1876, an average cost is stated of 2s. 7¼d. per square yard of roadway per annum. In an extreme case a wear of as much as 7 in. of road-metal is indicated in a year. On 123½ miles of macadamised road in the suburban highways of the metropolis, on the Middlesex side of the river, in 1855, the cost was not more than 7¼d. per square yard per annum. The difference is of course due to the relative amounts of traffic thrown on the roads. On an examination of the macadamised road in the Mall, in St. James's Park, mentioned by the last-named authority, under citation from a work by Mr. Mitchel, on "A New Mode of Constructing the Surface of the Streets and Thoroughfares of London and other great Cities," it was found that 50 per cent. of the crust was composed of mud and sand, including fragments of stone, not more than 3-16ths in. thick. Nine-tenths of the cost of maintaining a macadamised road is incurred in the purchase of road-metal. This may be taken, if it be Guernsey granite, at 16s. per ton delivered on the road. Thus we find that in lines of such constant traffic as that which follows the Regent-street and Parliament-street course, nearly one-third of a cubic yard of road-metal per square yard of road is ground into mud, and has to be removed by the scavengers in the course of the year. On a 30-ft. roadway this quantity amounts to 5,866 cubic yards per mile per annum. It may be readily seen from these figures why the nuisance of constant repair, and constant formation of mud, is such as to render macadamised roads out of the question for urban traffic. The one thing in their favour is their comparative quiet, as compared with stone pitching. On the other hand, they can never be absolutely clean, in any weather; and their disintegration is one source from which is produced much of the mud that is carried by the traffic on to pavements which might otherwise be far cleaner than is actually the case.

Stone pitching has the advantage over macadamised roads in durability, cheapness, and cleanliness. It has the cardinal disadvantage of being at once the noisiest and the most unsafe of all pavements. In thoroughly wet weather, indeed, granite is less slippery than either asphalte or wood. We are not in possession of comparative experiments made with macadamised road, but they are unnecessary, for the reasons given above. In a set of experiments made, during a period of fifty days, under the direction of Mr. Haywood, for every horse that fell on a wood pavement (taking equal numbers of horse-miles), 1·7 fell on asphalte, and 2·5 fell on granite. In looking at the concentrated traffic of the City, this single consideration is almost conclusive. The hindrance to business caused by street stoppages is a terrible tax, not only on the patience, but on the pocket. In Adelaide-place, London Bridge, according to Mr. Clark, where the road is 41 ft. wide, 16,000 vehicles pass in twelve hours. In Bishopsgate-street Without, over a width of 22 ft., 8,000 vehicles pass in the same time. In Cannon-street, over 36 ft. of width 12,000 vehicles pass. The average is 362 vehicles per foot wide of road per diem; or, we would rather say, 2,896 vehicles per line, or track of way, in the twelve hours. This is about four vehicles per minute, and, if the strain of traffic were unbroken, allowing 21 ft. for a vehicle, its horses, and an interval for safety, would give a mean uninterrupted speed of about one mile per hour. Stoppages, intervals, crossings, and irregular distribution of traffic during the day may make this arithmetical mean vary to four or five times its calculated value. As a rule, a man will make more way on foot in the City, during hours of business, notwithstanding the density of the foot traffic, than he can in a cab.

Now, reverting to Mr. Haywood's figures, we find that, during the fifty days of his observations, a horse fell for every 330 miles travelled on a wooden pavement. We take this as the unit, because it is the lowest ratio of falls, and is thus the general unit of safety, although an "improved wood pavement" is said to be safer, in the proportion of 446 to 330. It is difficult to give accurate results from the above facts, because the difference between the concentrated traffic at such spots as we have indicated, and the general traffic over the fifty miles of City roads, is not at present calculable. Neither can we tell the number of horses entering the City, nor the mileage which they make within it. But if we take the before-given figure of 2,896 vehicles, and allow 1·5 horses to each, travelling half a mile in each direction, or one mile in all, we shall have 4,344 horse miles per diem over a single track of road in the densest parts of the thoroughfare. This would give 13·4 falls in the twelve hours on one track, or 53·6 falls per day over the width of a 32 ft. road, for half a mile of the safest pavement. These 53·6 falls would be increased to 134 falls if the pavement be of granite. It is less easy to assign a value to each fall, as to the amount of interruption it would cause. It must be remembered that it is the exception, rather than the rule, for a horse to fall so as to block up only his own line of way. Generally an accident stops two if not three lines of traffic. But if we allow only a couple of minutes for the delay caused by each accident, we shall see that a loss of, at the very least, twenty-six minutes out of the short business day will be occasioned to the traveller over the distance, given on an average through the year. The tax that a slippery pavement thus imposes on the very life-blood of the metropolis,—the working time of its busiest men,—is thus rather indicated than estimated. Taking the chief time of business at six hours, from ten to four, 53·6 minutes are lost within the half mile in question on all the width of the road. We before estimated the arithmetical mean speed of traffic at a mile per hour. In two minutes, the period allowed for stoppage, a traveller would advance 88 yards. Within that distance would occur, on the given theory, a line of 12·6 passengers. Therefore, for the normal number of 53·6 falls, 675 persons would lose two minutes each. This is, no doubt, an under statement; but we are anxious to keep within the mark. The difference, then, in long time between the most slippery pavement, granite, and the least slippery, wood, will be equal to the loss of two minutes a piece by 1,013 persons, or to 33·4 business hours to one man. Thus at least a business week of somebody's life is shown to be wasted by every fall of a horse,—although the loss is divided into thousands of fractions, each fraught with its special cause of irritation, which cannot be measured by mere lapse of time.

After this it is not of very much use to repeat that the pitching of granite is the cheapest of all pavements, not exceeding in annual cost the price of 8d. per superficial yard. The amount of safety, indeed, has not been neglected in arriving at this price. The hardness and durability of the Penmaen Mawr stone are so far greater than is the case with granite, that a very great economy in the wear of material would be effected by the employment of the former material. But these very qualities of durability and hardness render the stone in question so excessively slippery that it has, by common consent, been laid aside for paving purposes. The blue Guernsey granite is far from being the hardest, even amongst granites, but it seems experimentally to have given more satisfaction than any other stone. The shoe of the horse meets with that amount of resistance from this stone, and causes that amount of abrasion, which hits the best limit of safety, on the one hand, and destruction of the roadway on the other. It must be observed, however, that while 8d. per yard is a fair average price for the maintenance of a granite pavement, it will not suffice for that purpose where the traffic is extraordinary. In Cheapside, Poultry, Old Broad-street, Moorgate-street, and Lombard-street, in 1871, the average total cost per square yard per year came to 1s. 7d.; rising, in Old Broad-street, to 2s. 9½d. for a pavement of setts of 3 in. by 6 in. of Aberdeen granite. The cost of a similar pavement over London Bridge, for twenty-one years, averaged 1s. 10¾d. per square yard per year.

Between asphalte and wooden pavements, avoiding, as before mentioned, details as to different plans, the balance of expense does not very materially vary. It is probably slightly in favour of the latter; and may be taken for either at an average annual cost of 2s. 6d. per square yard. The advantage of silence, which both these pavements possess in an extraordinary degree as compared with granite, may also be taken as somewhat in favour of the wood. Asphalte is remarked to become more noisy the older is the roadway, a fact that probably arises from the compression of the material by traffic. On the other hand, the balance of cleanliness is apparently in favour of the asphalte, although it is by no means certain that it does not contribute more mineral element to the formation of mud than is the case with the wood. But the facility of cleansing, in the case of asphalte, is perfect. The use of a gutta-percha scraper or *squeegee* will keep both footway and roadway in excellent order for a less cost than that incurred by the far less effective scavenging of the granite sets. And by the turning of a jet of water over the roadway, a purity may be maintained that is almost absolute. It must be borne in mind, too, that these silent pavements have not hitherto had fair play in London as to cleanliness. So much mud is brought, in wet and in damp weather, from the stone roads, whether pitched or macadamised, that the silent pavement is laden with much extraneous matter, which is not due either to its own abrasion, or to its proper traffic. The mineral constituents of mud from stone-paved streets have been found to vary from 42 per cent. in dry weather, to 80 per cent in wet weather, when the abrasion is the greatest. The average is over 50 per cent. It is perhaps not to be supposed that a saving of 50 per cent. in the amount of mud formed would be effected by paving all the great thoroughfares, or, indeed, all London, with wood. But that there would be much less abrasion, and that of a less unmanageable material than powdered granite from a wooden pavement, there is little room to doubt.

One other feature has to be regarded, which has been almost absolutely left out of sight. The effect of a great fire on an asphalte pavement would be most formidable. Wood, indeed, might suffer, if the heat were very great. But, laid as pavement, it is not to be expected that wood would do more than char. Asphalte, even if it did not burst into flame, or rise in dense volumes of smoke, would become soft and impassable. In the case of any very serious conflagration this consideration might prove to be of the most signal importance.

We invite the independent consideration of our readers to the facts to which we have endeavoured to draw their attention. We might have gone into more detail as to the evidence as to what is, as yet, the best pavement offered to the public; but we preferred to treat the question broadly on its merits, and thus to steer perfectly clear of anything that might resemble personal prepossession or private favour. We think it looks as if the future paving of the metropolis must be of wood. If that proposition commands a general assent, it will be then time enough to discuss the best kind of wooden pavement. For quiet,—an element of extreme importance,—wood is the most silent. For safety it is the first of all practicable materials; for macadam is not one of these for a concentrated traffic. In cleanliness it is exceeded only by asphalte. Durability comes under the question of price. As to this, while the average cost of the wooden pavements taken to and laid in London is from three to four times that of the granite sets, that comparison does not show the subject in a right light; for it is comparing the cost of wood, in places where the traffic is usually very great, with that of stone over a larger average of road. But when we look at thoroughfares of very heavy traffic, we find the disparity of price diminishes very much. Thus the s one

paving over London Bridge costs 60 per cent. of the prices given (as actually resulting from experience) for wood. In Old Broad-street, as we have seen, it costs more. If to the consideration of the money value of time saved, and of cleanliness improved, by the use of wood, be added that of the saving of nervous distress caused by the absence of noise, we think it is apparent which way the balance leans. To indicate that tendency is the limit of the function of the public writer. He is most happy when he has no need to express an opinion of his own; but when he is satisfied that he has so fairly produced the facts of the case, whichever way they tend, that the formation of the definitive judgment may be a matter of mechanical simplicity.

BLOTS IN BRISTOL.

BRISTOL is an undoubtedly picturesque and interesting city, in regard both to its aspect and its history; it is also, like many other places which have that character, very dirty. We only here allude to this feature in the immediate outward aspect of the city, because when any one begins to consider Bristol from a sanitary point of view, that is the first and most obvious fact which strikes the eye,—how peculiarly muddy the streets are, and how begrimed and blackened many of the buildings. And though there may be something in the nature of the soil on which it stands to contribute to the extra dirtiness of its streets, or perhaps in the rapid variations of level and consequent confluence of wet and dirt on the lower levels, one feels that the fact of a town government being content to leave its streets so unclean is indicative of other things, less immediately apparent, some of which we propose to touch upon.

The fact is that Bristol, for a city which has had a name in history for riots and seditious outbreaks, seems at this present moment to be one of the most "conservative" places in the kingdom, if we take that term to imply a general tendency to be content with things as they are. We are fully aware that very large sums have been spent within the last ten years in improving thoroughfares, and that a certain number of the citizens are most munificent subscribers to such works as the new nave of the cathedral; but the large body of the inhabitants require to be awakened to the necessity for some improvements of a more practical nature. The official authorities of the city appear to be dilatory or divided in their counsels in regard to applying the machinery of reform, for Bristol has as yet made no step towards putting into operation the provisions of such a measure as the Artisans' Dwellings Act, in furtherance of any practical improvements, though the city is exactly one of those for which this and other Acts of the same tendency would seem, in regard to their spirit at least, to have been specially framed. The very circumstances which combine to give Bristol its picturesque character also conduce to make it a place much in need of modern improvements. It is one of those towns which have grown up spontaneously, and in accordance with no plan, following the irregularities and declivities of its site; a place where no street is at right angles to another, and which is full of narrow crooked lanes, and dark obscure corners, where old neglected houses hang together higgledy-piggledy, and blacken and decay and become filthy and unwholesome, out of sight and hearing of those who do not go to look for them. And when it came to our ears that some public-spirited persons in Bristol were making efforts, in their capacity as private individuals, to induce the authorities to apply the Artisans' Dwellings Act without delay in regard to two or three large blocks of property of very objectionable character, and in other ways to inaugurate public improvements of both moral and material importance, and that so far they had failed to receive any support from official sources, we felt moved to look for ourselves into the state of things and give help where help seemed to be wanted. We will therefore briefly describe what we saw for ourselves in a morning's ramble among the "picturesque" nooks of Bristol.

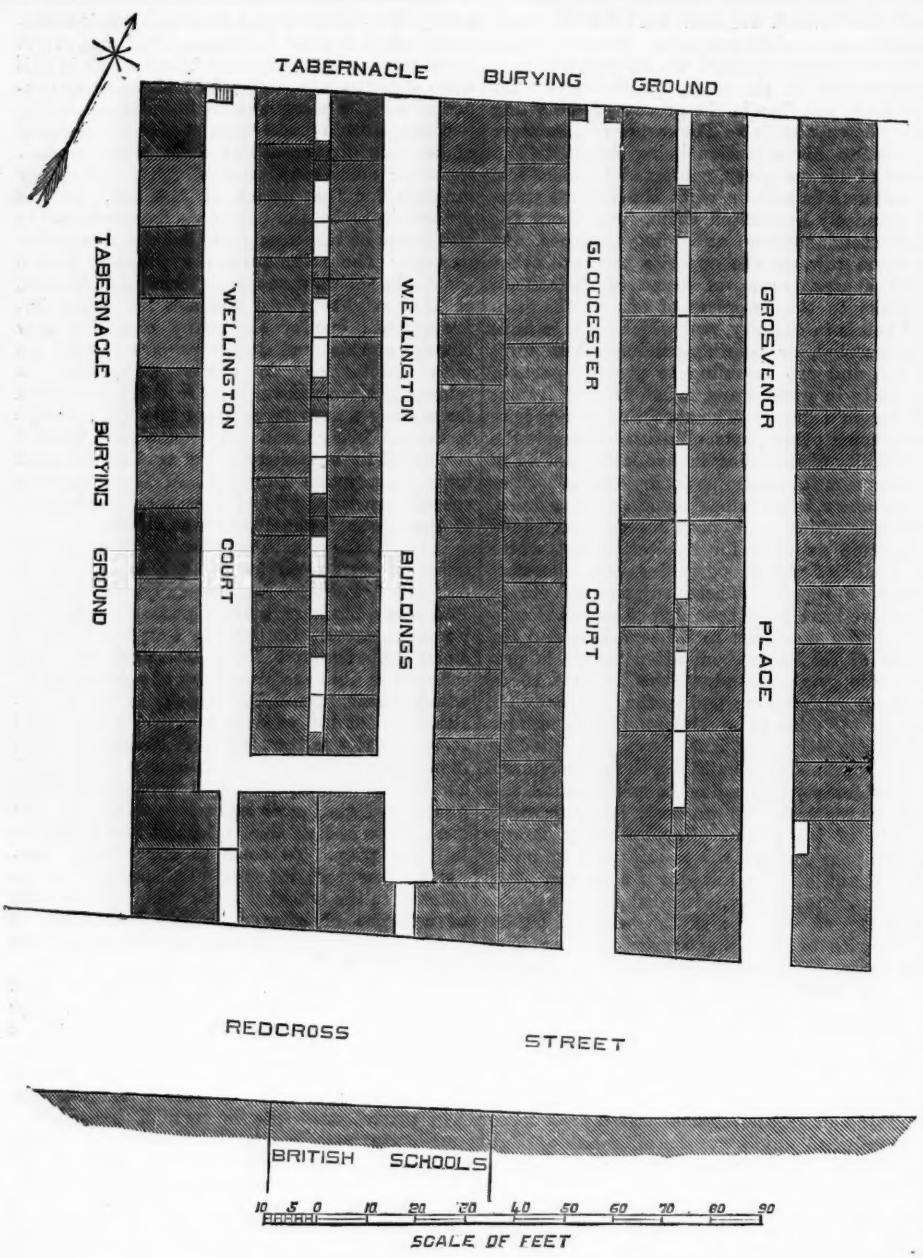
The first plot we visited was that between the angle of Broad-street and Wine-street, two of the principal streets in the city; Wine-street being, in fact, the Cheapside of Bristol. Along this space there wriggles a very narrow lane,—Tower-lane,—a paved footwalk with an open channel in the middle, which is said to be unsafe for respectable people at night, and which is lined with houses nearly all of which are now used for the most degrading and vicious purposes. Some of these ill-omened places belong, we understood, to a church-vestry in the town (!), being let for three lives, and then in the process of subletting coming down to this.* The owner of two more of them, on his attention being drawn to the nature of his property, confessed that he had not had an idea who or what the tenants were, but promptly evacuated them, and there the houses stand, shut up and going to pieces. In the same row, on the opposite side, are other ruined houses, some of them in immediate proximity to the premises of one of the principal hotels in the city, and which seem to have been deserted, or possibly condemned as unfit for use, and are tumbling to pieces,—parts of the walls in great gaps, windows and frames hanging in tatters. The aspect of things here and in some other parts of Bristol suggests the advisability of including in bye-laws relating to building some clause empowering the authorities to take down, or to compel owners to take down, structures which have been deserted or legally condemned as unfit for habitation, but which the owner of the property does not choose to rebuild or repair. These ruined and empty houses we have been speaking of are obviously in too bad a condition to be tenanted, and the chance of reletting them after repair is probably too small to induce the landlord to do anything with them; and so they rot away till they get to a state to be condemned as dangerous to public safety. But it is in every way bad for a neighbourhood that buildings should be allowed to stand empty and going to pieces until this point is reached. To proceed, however, with our tour of inspection. Further along Tower-lane we pass through a low dark passage under a house, and to the left down a narrow steep lane known as Pit Hay,—just one of those places which look so well in a sketch, with old gabled houses with overhanging stories and begrimed with age and dirt; they are mostly occupied as shops or small taverns, apparently not otherwise than respectable in one sense, but with a dirty slatternly look pervading them which is in keeping with the general aspect of the street. At the upper end, where we entered it from Tower-lane, the old buildings overhang and crowd so closely as to make it a dark corner even in broad daylight. Turning left again at the bottom of Pit Hay, we come to the ground below and at the back of the Tower-lane property, and, at the end of Wellington-street (only a back alley in spite of its name), find ourselves again amid a collection of houses of ill-fame, with exteriors to correspond,—smoke-blackened places, with windows and doors all awry, cement coming off in patches, and everything presenting as repelling an appearance as well could be.

Through the neighbourhood we have been describing it is the object of some of the few townspeople (for they seem to be a decided minority at present) who are interested in procuring improvements, to get a new street driven, which will carry on the line of Bridewell-street, a broad thoroughfare leading into the city from the north-east part of the town, to meet Wine-street, providing a straight main route between two important points where only a circuitous one is now available, and breaking up and demolishing at the same time Tower-lane and Pit Hay, with their iniquitous and squalid surroundings. Whether the condition of the house property in this region is literally such, in regard to its sanitary arrangements, as to qualify it for a compulsory application of the Artisans' Dwellings Act we do not here undertake to say; that must be investigated by an official who has an unquestioned right to enter; but in regard to this new street scheme the matter is being urged on the broader grounds of public convenience and public morality; and having seen the neighbourhood itself, and the plan of the proposed improvement, we do earnestly urge upon the authorities of Bristol the advisability of procuring Parliamentary powers for supporting and carrying out without delay an improvement which would be a positive public benefit (especially as the new Magistrates' courts are to be erected in the immediate vicinity), and at the same time afford opportunity for obliterating a disgraceful neighbourhood. And it must be remembered that street improvement is an immense moral agent in this way: sometimes the only effectual one. Acts connected with town improvements do not ostensibly,—perhaps could not,—legislate for the removal of districts on account of their moral unsanitariness: such matters are hardly sufficiently tangible for the action of the law. In the present instance, the houses we have referred to will never be taken or occupied for any better purpose: the stigma on the property is too great. In such a case the material improvement of the neighbourhood becomes its moral improvement: one of the many examples how closely morals and manners are bound up with habitations, in towns especially. A scheme has, we believe, been recently sanctioned for making a new street from the draw-bridge to Bristol Bridge, and very much such a street is wanted for considerations of traffic; it should have been made long ago, in fact; but the scheme can hardly have the moral importance of that through the Tower-lane district.*

We looked next at some property in which the technical conditions for the application of the Artisans' Dwellings Act are fully exemplified. This was a block of cottage property adjoining Redcross-street. On the way to it, along Broad Mead and through Merchant-street, we had occasion to note the proportion of public-houses, which seems unusually large; in Merchant-street (about 150 yards in length) we are afraid to say what was the total from recollection, but in one block of nine shops five were "publics." The typical Bristol public-house is not, however, so gaudy and glaring an attraction as the London one: there is less show of paint and gilding to lure the prey. To come to our cottage property, however; its general disposition is indicated in the annexed block plan. It consists of a series of rows of houses built back to back, with courts 10 ft. wide between; these courts are blocked at the upper end by a wall nearly the height of the cottages, so that there is no circulation of air through. The cottages are two-storied: they are not in a specially dilapidated condition, and the inhabitants seem respectable; but their arrangement is entirely subversive of health and decency. The privies or closets are some of them in little out-houses attached to the back in a narrow strip of open space between the backs of the houses; and these are the best, though these are dangerously close to the living-room door. The rest are placed in front of the houses, entered by a door flanking the house-door, and of course in full publicity and directly facing the windows of the opposite house. The remainder open at the back *directly from the living-room*, under the stairs, and without any external ventilation. They are mostly, if not all, water-closets with no water laid on, but worked by water that must be brought from the stand-pipe in the court and poured down. How often this is effectually done, and what the state of the traps and soil drains is likely to be, may be pretty well guessed. The closets which are at the back of the houses drain under the houses to a drain running down the centre of the court, which also takes the surface water through gratings in the flagging. The probable state of these drains is indicated by the pools of standing water we noticed over and around the gratings in some of the courts. The inhabitants did not, as far as we conversed with them, complain particularly,—people who live in unsanitary abodes, whether rich or poor, very seldom do, unfortunately; *they leave the death-rate to do it for them.* In this case the death-rate has averaged nearly fifty per 1,000 recently, the general average of Bristol being

* We are assured by a correspondent who has the means of being well informed, that most of the brothels in Bristol are houses *originally* leased by the Dean and Chapter, Trustees of Charities or Vestries, or by the Corporation. Of course these are sub-let in a manner that puts their original owners beyond any direct cognisance of the state of the property of which they have the reversion; but they can hardly be freed from a certain degree of responsibility in relation to it.

* We should like to suggest, however, whether the making of this street between the two bridges might not be the opportunity for so far improving the approaches to and surroundings of Queen-square, as to bring it into occupation again by a good class of tenants. It was obviously, before the dock and the "new cut" were made, the principal centre of old Bristol, and seems now to be sinking into offices and lodging-houses; but though the houses look a little dingy now, the square is essentially one of the best laid-out squares we know; and from our acquaintance with the domestic buildings of the period when it was made, we have no doubt that the older houses in it, sober as they look, are much better built than many of the modern showy ones in Clifton. It is quite a pity that a square so picturesque-looking, with its trees and cross-walks, and equestrian statue in the centre, and so interesting in its associations, should be allowed to be thrown away, and sink into third-class property. A short but good street from the centre of the north side of the square, joining the proposed new street from Bristol Bridge, would bring Queen-square again *en rapport* with the leading thoroughfares of the town, and give opportunity for its revival.



between twenty-three and twenty-four, and typhus has been prevalent. The authorities of Bristol have been memorialised to apply the Artisans' Dwellings Act to this property; and this property, with the sanitary and social arrangements and the death-rate above mentioned, their medical officer of health, strange to say, has refused to condemn. We should like to hear his defence.

On our way between the main points of interest we had occasion to notice one or two other interesting corners,—samples, no doubt, of many others. We may allude to "Pope's Parade" as a nook worth attention. Some houses at one side of it had been bought and re-let on Miss Octavia Hill's system, and the space in front of them re-flagged; on the other side the ground before the front doors is a shapeless embankment of mud and rubbish, from which corners and broken pieces of old flagging protrude, to remind one that it once looked a decent place. The visitor to "Jarman's-court," Broad-mead, may assure himself that the inhabitants have privy accommodation, as one of these necessary chambers, with no door, faces every one coming up the entry. Repairs have recently been done to the houses, but owners seem to feel under no obligation to assist decency, even where they consider other wants of the tenants. In a court in Leek-lane we found sanitary progress at work,—drain-pipes were being laid for the first time, which, it was to be hoped, would have the effect of improving the health of the inhabitants, but their chances did not seem over good even then; the small houses, one or two of them inhabited by very large families,* have the living-rooms sunk below the ground, while the upper rooms are almost in the roof; privies opposite the houses. Below the trench cut for the drain pipes was visible the top of a well or cesspool, but which, at all events, must have practically acted in the latter capacity, being just adjacent to the privies, and full of foul, contaminated water. Was this water to be left there? we inquired; and before leaving we elicited that the owner had been there that morning, and had nearly been persuaded to remove the water and fill up the well, but had eventually concluded he would not do so "until some further requisition were made to him"; so we presumed the drain-pipes were given on compulsion, and that the mass of putrid water still festers 4 ft. below the surface.

The other large block of property, which some of the well-wishers of Bristol want to see condemned, is situated in the angle between Lewins Mead and Lower Maudlin-street. Lewins Mead itself is a long straggling street containing some of the oldest houses in Bristol, picturesque in a certain way—at least they would appear so in a drawing; but it would be impossible to exaggerate the dirty, grimy, and forlorn look which many of them present, not to speak of their rickety condition, some of them seeming only to remain upright through the support of contiguous buildings. The property spoken of, adjoining this fragrant "mead," is occupied by warehouses and dwellings in crowded blocks intersected by very narrow allies and courts; and a block which forms an island in the middle consists entirely of brothels. Among the dwellings more respectably occupied we entered one which was impressive enough in its way, near a corner called Quaker's Friars. The houses here remind one of a rabbit-warren: you plunge down some steps into a dark hole, and in a corner where you can scarcely see is the entrance-door of a dwelling; you clamber up other steps to the left, and then up others to the right, all in nearly utter darkness: eventually we made our way up a perfectly dark and rickety corkscrew staircase which required some caution in its ascent and descent, and were introduced by the tenant, a feeble, decrepit old woman, who had with difficulty preceded us up the stairs, to her dwelling, a single small room containing two beds and a chair: her married daughter and son-in-law shared the room with her; he was out of work and had nowhere to go, and she was "that lonely" that she was glad to have them with her. The room was dreadfully close, and we at once noticed that the skylight by which it was lighted was a fixed sash, and would not open. Was there no ventilation? we asked; and we were shown a niche in the wall over one of the beds, looking like the commencement of a flue, and round the corner of this it was understood that there was a small ventilator of some kind which could be pushed open with a stick; she climbed on the bed every morning, she assured us, and managed to open it with her stick. The room adjoining on the same floor had been shut up by the landlord himself, as unfit to put any one in. This was a specimen of another block of property which the medical officer will not condemn. The death-rate in this property, we may add, has been near upon fifty recently.

In reference to this refusal to condemn, let us point out that the Artisans' Dwellings Act is not over-stringent in its terms as to what must be proved against an area to justify its condemnation. The general phrase, that a certain locality is in a state "unfit for human habitation," is followed by the very extended interpretation (clause 3 of the Act) "or that diseases indicating a generally low condition of health have been from time to time prevalent in a certain area within the jurisdiction of the local authority, and that such prevalence *may reasonably be attributed* to the closeness, narrowness, and bad arrangement, or the bad condition of the streets and houses, or groups of houses within such area," &c.; a form of expression that allows latitude enough to condemn any neighbourhood that is much in need of improvement, without standing on niceties of wording. We observe, however, that the Local Bye-Laws of the Bristol Board of Health, in the clause dealing with buildings "unfit for human habitation," sums up its condemnation in that phrase, which of course to many will seem a very strong expression, requiring a very bad condition of property to justify it; and perhaps the habit of considering the matter in reference to this wholesale phrase may have had its influence on the official mind. The Bristol Board of Health would do wisely to extend the wording of that clause, as well as to amend some other old-fashioned prescriptions in their code, such as that which states that "no cesspools shall be allowed, *except when unavoidable*," which must mean when the owner or the authorities will not go to the expense of providing drains. Seeing that it is universally recognised that a cesspool in a town is a serious danger to health, the rule is about as reasonable as if a criminal statute were to enact, "burglary shall not be allowed, except where the circumstances of the burglar render it necessary."

By way of an agreeable contrast, we may note one or two beneficial movements that are being carried on in Bristol. Against the numerous and dowdy-looking taverns with which the town abounds, we may set the recent opening of several "coffee taverns," two or three of which we went over, of remarkably comfortable, clean, and neat arrangement, and which are largely used by the working men; indeed, the admirable look of everything, eatables included, coupled with the low prices, induced us to inquire as to the return on the outlay, which, as we feared, did not at present reach a really remunerative figure. It may be a point of wisdom, however, to start such a movement by making it a little attractive at first, until it has got fairly going, when the securing of remunerative return will be easier. Prints and water-colours are also lent for the adornment of these rooms; and in the largest of the houses, which possesses a long upper room, it is proposed to have cheap concerts periodically. We also saw some "model cottages," built by the Industrial Dwellings Company, on a site facing Brandon-hill; these, which form three sides of a quadrangle round a courtyard, are nearly all occupied, and we understand are paying well, though built in an apparently much more costly manner than is generally the case with model houses in London, and with a certain degree of architectural effect.* There are points in their arrange-

* We should imagine decidedly over-crowded, but did not take a census of numbers. As a rule, however, we did not see reason to think that over-crowding was a special evil in Bristol,—at least, not to anything like the extent we are familiar with in London.

* The architect is Mr. E. Hoole, of London.

ment that might be amended; the position of the closets off the staircase is somewhat too public and too closely connected with the interior of the building, though there is a good through draught; and it would have been better to have grouped them separately for men and women; it is a mistake to go on the principle that people in that class do not want these refinements; it is the very provision of them in the plan of a building which is itself a refining influence, as has been often observed. The company have acquired land adjacent whereon to continue their operations. If it is correct, as we heard, that there is a disposition to make their next block of buildings of a higher class, to be let at larger rents, we must say that we think that a mistake at present. It is the lowest class in the scale of wealth who above all have need of healthier habitations, as they have least power of choice among existing ones; and the wished-for application of the Artisans' Dwellings Act gives the greater force to this reasoning, since it is of little use to turn people out of bad dwellings unless they have a chance of getting into better ones. The rents even of the present block are a trifle too high by comparison with the rents paid by the same class of tenants in other parts of the town: and though, of course, it is reasonable that tenants of whatever class should pay something for getting into better and healthier quarters, rents that are materially in advance of the previous current scale will defeat their own end, especially in regard to that class whose possible margin for increased outlay is so very small.

Looking again, in conclusion, to the general question of Bristol improvements, we should like to remind those most concerned how very little they have done to carry on the work which really promised to give a great new start to the place in the early part of the century. So little has really been made of this, in comparison with what might have been, that probably many visitors to the city at present are not in the least aware that the river which they cross at "Bristol Bridge," as well as the long float higher up, was brought there by artificial means half a century ago, when Bristol was made into a port by altering the course of the river, which formerly took a long bend away from the city. A writer in the able guide-book published under the sanction of the Executive Committee of the British Association (when that body last met in Bristol) expresses the opinion that the possibilities of prosperity and of a highly successful future are still all before Bristol, and that her real history as a modern city is to come. That may very well be; but the fair start will not be given to that promised career until the Bristolians show a real determination to make their city presentable and attractive, as well as to do away with its degrading and unhealthy spots. Though it may not be very easy to trace cause and effect in these matters, in detail at least, experience certainly shows that business and public interest on the largest scale will not be attracted to a modern city which does not outwardly show itself awake and eager to make a good appearance before the world. A city that is content with dirty crooked streets and grimy buildings will not, so long as that sort of contentment lasts, obtain a first-class position. Bristol may take Aberdeen as an example. Aberdeen was formerly just such a town as Bristol for the most part still is: dirty and squalid, and full of crooked lanes and dark corners. By a great effort, which left her for a time practically bankrupt, she changed the whole face of things by the great new street carried from end to end of the town; one of the most spirited things ever done by a corporation, and which (as those testify who have the best reason to know) has been the making of the prosperity of Aberdeen. There is unquestionably far more surplus wealth in Bristol than there ever was in Aberdeen; and with the development of the improvements that are so much wanted, the real prosperity of Bristol as a modern city will begin.

St. Giles's Cathedral, Edinburgh.—A meeting of the committee for the restoration of St. Giles's Cathedral, Edinburgh, has been held, Dr. William Chambers presiding. Mr. William Hay, architect, submitted a plan of the proposed restoration of that part of the building recently occupied as a place of worship by Trinity College Church congregation and now vacant. The committee approved generally of the plans.

THE GREAT WORKS AT THE CHIEF FRENCH PORTS.

THE gradual development of the ports of our own country that has accompanied the great increase in inland and maritime traffic caused by the introduction of steam transit has been notable in many respects. Birkenhead, for example, is a new creation, and the extension of dock accommodation, both on the Mersey and in the Thames, has been very remarkable. It may, however, be questioned whether the engineers of this country have in any instance attempted so bold a remodelling of an ancient harbour as has been effected, and is in course of completion, in the port of Havre de Grace. At Marseilles, again, a new city is rising on the shores of the Gulf of Lyons. The works at Havre have more interest for the English architect or engineer than those on the Mediterranean seaboard of France, owing to the fact that they have to be executed under conditions similar to those existing on our own tidal shores and estuaries. The Marseilles works come under a very different category, as the Mediterranean tides never exceed a few inches. It is thus the case that tide-work in the construction of foundations, that is to say, taking advantage of the ebb to save pumping, is impossible. On the other hand, the difficulties caused by the steady formation of deltas in a tideless sea drive the constructors of harbours to avoid the mouths of great rivers, and also, as at Marseilles, raise serious obstacles to the sanitation of the seaport towns.

Havre, founded in 1516 by King Francis I., was first provided with a basin and quay in 1628, by Cardinal de Richelieu. The former was improved, and transformed into a wet basin in 1667. From time to time the jetties were prolonged, in order to keep the shingle from the entrance channel; groynes were established on the westward shore; and three scouring sluices were successively constructed.

In 1787 the plan of Lamandé for the enlargement of the port was carried out. It consisted in the formation of the two basins of La Barre and Le Commerce; in the prolongation of the fore-port; and in the establishment of a sluice and reservoir for scouring to the south of the port.

This work was not complete until 1834. At this time Havre comprised an outer basin, a fore-port, four wet basins, and three scouring sluices. The fore-port had an area of 24·72 acres, with 700 yards of quay, and 9,500 square yards of platform. The wet-docks, with a surface of 30 acres, were surrounded by 3,000 yards of quays, and 50,000 square yards of platform.

The sills of the gates giving access to the wet-basins were laid 3·77 ft. below the datum line of the French marine charts; a level which allows a depth of 16·4 ft. at neaps, and of 21·97 ft. at ordinary springs. The entrance-channel had nearly the same depth within the fore-port, but the remainder of this area, and the outer part of the channel, were not so deep.

From 1835 to 1839 the average tonnage that enterred the port amounted to 549,202 tons, in 4,524 vessels.

In 1839 and 1844 laws were passed to authorise the creation of the Vauban and the Eure basins; the establishment in the La Floride reservoir of a provisional basin for steamers; the construction of a graving-dock; and the deepening and improvement of the fore-port.

The gate of La Floride, the sill of which is 3·28 ft. below the level of those of the gates of Notre Dame and La Barre, was opened to commerce on the 14th of October, 1847. On the following day one of the mail-steamers plying between France and the United States entered the basin of La Floride.

The deepening of the port, commenced in 1846, was at that time well advanced. The object of the works was to lower the fore-port to a depth of 1·15 ft., and the canal to a depth of 4·42 ft., below the datum level. This object was not fully carried out. Large quantities of shingle were removed from the north of the jetty, to prevent its entrance into the channel. From 1848 to 1852, an average of 4,509 ships, with a tonnage of 581,476 tons, entered the port each year.

In 1854 a law was passed authorising the city to advance a sum of 320,000*l.* for the formation of a dock basin, and the improvement and deepening of the fore-port. The work was only attempted by means of dredging.

In January, 1864, the gate of "The Transatlantics" was opened to navigation, and the large graving-dock received a vessel for the first time. A gridiron and a private wet dock were all the facilities axisting for careening up to this time.

The gate of "The Transatlantics" has its apron 9·35 ft. below datum, and the opening has a width of 100 ft., these dimensions being required for the reception of large paddle-wheel steamers.

At this time Havre possessed all the requsites of a great port. The fore-port covered an area of 27·2 acres; the surface of the basins amounted to 126 acres; the length of the quays was 7,800 yards, out of which ships could lie alongide of 6,800 yards; and the surface of the platform was 133,000 square yards. The graving dock was 426 ft. long at the bottom. It could receive ships of the length of 492 ft. The entrance-gate was 98·4 ft. wide, and the depth of water over the apron was 23 ft. at neaps, and 28 ft. 6 in. at springs.

The width of the entrance channel to the right of the southern pier-head was 246 ft. Beyond, the width, which had formerly, in certain parts, not been more than 106 ft., had been increased to 262 ft., by the removal of the towers called Vidame and Francis I. The fore-port had been lowered to a depth of 5·4 ft. below datum; the channel, clear of the jetties, had a depth of 7 ft. below datum for a length of 436 yards, and a width of 109 yards.

The scouring system has been altogether abandoned. It could no longer be relied on to maintain the requisite depth, and recourse was had to dredging. The conditions proper to render scouring available are absent in the case of Havre, where the only reservoir, that of La Floride, is small; and the discharge of the sluices produced no effect on the bottom of the channel, which was covered with at least 6 ft. of water in the lowest state of the tide. Moreover, the material removed from the harbour by scouring formed those *buttes*, or sand banks, without the port, which were so much dreaded by the pilots, and which have now been removed by means of dredging.

From 1864 to 1868 the annual movement of the port comprised 6,015 ships, with a tonnage of 1,086,991 tons.

In 1864 the Chamber of Commerce decided that it was desirable to form a wet basin for the coasting steamers, and that the site of the ancient citadel should be made available for this purpose. By a law passed in the following year the Chamber of Commerce was authorised to expend the sum of 192,000*l.* for this purpose. The new basin, its lock entrance, and its three graving docks, were opened on the 5th December, 1871.

In the July of the year preceding, a decree was issued which declared the public utility of the enlargement of the fore-port, the completion of the Eure and Vauban basins, the construction of the St. Jean mole, and other works of less importance. For the execution of these works the Chamber of Commerce furnished a subvention of 280,000*l.*, and further advanced to the State a loan of 240,000*l.* All the works in question are now finished, with the exception of the enlargement of the fore-port, and the completion of the Vauban basin.

The Chamber of Commerce is reimbursed for this outlay by the imposition of tonnage dues. These are fixed at 75 centimes (7·2d.), per ton on French or assimilated ships; and at 90 centimes (8·64d.) on other vessels. A reduction of 30 centimes (2·88d.) per ton is made in the case of vessels of which more than nine-tenths of the cargo consists of coal, ice, or pine wood. French coasters and vessels not carrying on commerce within the port are exempted from the above dues.

In addition to the above works, improvements have been made in the appliances of the port; especially in the substitution of movable for fixed bridges. Of these the last decided on is the Eure bridge. Placed over a sluice of 52 ft. 6 in. in width, this bridge is 115 ft. 8 in. in length. Its weight, including a counterpoise of 25 tons, does not exceed 145 tons. Its cost was 2,720*l.* Two or three men can open or shut these bridges in less than two minutes.

In its present condition the Port of Havre consists of a channel between two jetties, a fore-port, eight wet basins, a lock entrance, thirteen dock gates, and four graving docks. The fore-port covers an area of 27·7 acres, with 1,800 yards of quay; although not more than 700 yards of quay, and 9,600 square yards of platform, are as yet utilised for the disposal of merchandise. The eight wet basins have an

aggregate area of 130 acres. Their quay walls are 9,755 yards long, of which 8,750 yards are utilisable for commerce. The surface of the platforms is 216,000 square yards. Five basins only open directly into the fore-port. They communicate with one another, and with the three other basins, by means of seven intermediate gates. The lock entrance is intended to prolong the time during which vessels can enter the basins, which is now about three hours, to between six and seven hours in each tide. It allows vessels to enter the basin of La Citadelle after the gates of the other basins are closed, and it allows vessels to put to sea as soon as the tide has attained a rise of 12 ft. above datum, at which elevation the lower gates of the lock are opened.

The draught of water of the ships which use the Port of Havre is determined by the depth of the sea over the level space which extends for nearly a mile and a half from the entrance of the port. The rise of the neap tide is not above 19·4 ft., and the depth of water over this area at the ebb is 6·56 ft. above datum on the charts; so that vessels drawing more than 23 ft. of water cannot enter the port during the neaps.

The annual cost of dredging is 8,000*l.* The fore-port, and the channel free of the jetties, to a distance of 545 yards from the pier-head of the northern jetty, are kept at a constant depth of 6·56 ft. below the datum of the charts. The bottom of the basins is periodically cleared to a depth of 1·6 ft. below the aprons of the entrance-gates. About 45,000 cubic yards of deposit accumulate each year in the fore-port, and 26,000 cubic yards clear of the jetties. Over the basins which communicate directly with the fore-port the annual deposit is about 2 in., and about half that depth in the others.

Twenty-six cranes, and three pairs of shears, one of which can lift 100 tons, have been fixed on the quays. The dock company has provided sheds on the quays of the dock-basin, and of the Vauban basin. Private sheds and warehouses are built on other quays. The mean number of vessels that have entered the port of Havre each year, from 1872 to 1876, has been 5815, with a tonnage of 1,637,010 tons. The dues have averaged 38,935*l.* per annum.

The execution of the works, of which full details are published, joined to that of the works for the rectification of the Seine, has produced a considerable effect on the maritime conditions of the port of Havre. As the tide rises, the current runs at right angles to the jetties until the mouth of the Seine is full. A counter-current then sets in, running N. 65° W., which is called the *Verhaule*. This current was formerly perceptible forty minutes before the time of high-water, and ran for two hours after that time. Its velocity was 5·74 ft. per second, for a tide of which the co-efficient is 100. Since the banking of the Seine has been carried out the duration of high-water is reduced by nearly forty minutes at springs, and by seven or eight minutes at neaps. The *verhaule* becomes perceptible from twenty-five to thirty minutes earlier than was formerly the case, and its rapidity is much greater. At Honfleur the time of high-water is now twenty-six minutes earlier than before these works were commenced.

Considerable silting up is taking place on both banks of the Seine. More than 20,000 acres of land have been reclaimed from the river, and the volume of water entering and issuing with each tide has been reduced by more than 100 millions of metric tons. The deposits which formerly occurred up the stream are now forming lower down. No diminution of depth has yet occurred in the immediate vicinity of the port of Havre. But constant vigilance has become necessary, as the danger is not remote, and the mode of protecting the port from further injury by the deposits of the Seine is already under consideration.

Considerable difficulties opposed the execution of a portion of the works for the extension of the port of Havre, owing to the occurrence of quicksands. The method adopted for obtaining a foundation on this treacherous material was probably suggested by experience of the well-foundations common in India, where numerous well-shafts are sunk through shifting sand, and being filled with stone and rubbish afford a perfectly reliable foundation, although they do not reach any solid stratum. Piles were first driven in two rows, on either side of the intended line of wall; they were connected by longitudinal timbers, and the earth was excavated down to the top of the quicksand. Wooden frames, covering each an area of about 20 square feet, were then placed at intervals along the line thus cleared, and brick walls, gradually oversetting, were built on the frames. As the brickwork was carried up the frames were undermined and gradually sank through the sand to a depth of 9 ft. or 10 ft., when a solid bottom was reached. The shaft thus formed was then filled with concrete.

The use of piling in foundations has probably been derived from the ancient lake dwellings, which stood on piles, and were accessible only by water. As applied to permanent structures, the theory of the bearing pile is, that the friction between its sides and the earth into which it is driven is sufficient to enable the head of the pile to support a given weight without sinking further. Thus the piers and abutments of Waterloo Bridge were built on wooden platforms, resting on piles 12 in. square driven 20 ft. into the bed of the river, which Sir John Rennie found to be strong gravel. In the case of London Bridge, which presented unusual difficulties, strong coffer-dams were constructed with three rows of piles; the ground was excavated within them to the depth of 30 ft., going below the low-water mark of spring tides; and piles of 12-in. diameter were then driven 20 ft. into the solid London clay, then reached, or until they would not sink more than an inch with a blow of a 12 cwt. monkey, falling from 18 ft. to 20 ft. The pile-heads, cut off to a level, were bolted to solid sills of timber, and covered with elm planking 6 in. thick. Notwithstanding this great care, when the first arch on the Surrey side was keyed in, and the full weight came on the foundation thus formed, the east end of the pier was found to have subsided from 10 in. to 14 in. more than the west end. This is only one of the professional data which show that the London clay is not to be relied on for a foundation, without great care.

The question of decay of piles is also important. In Holland, according to M. Gaudard, buildings on piles of larch, alder, and fir have lasted for centuries, whilst in Belgium large buildings have been endangered by the decay of the piles on which they rest. For alternate exposure to wet and dry, elm is the most reliable timber we have, but as to the behaviour of different kinds of wood when undisturbed in wet soil we have less information than would be desirable. The present course of practice is in favour of the use of iron cylinders in cases which formerly were managed by coffer-dams and bearing piles.

The plan of sinking shafts for foundations, which should protect the workmen who sink them, and which might afterwards become so many solid pillars of masonry, embedded in the sand or alluvial soil, is of great antiquity in India. It has been described by Colonel Foord, R.E., the Secretary of the Public Works Department of the Madras Govenment, in a handbook of public works in India published some years ago, which is now the text-book of the service. In many instances in India it would be impracticable to erect the large bridges required for the railways on any other plan, except at an enormous expense. The Indus and other rivers may be called travelling streams. In some places they gradually shift their beds, eroding the soil on one bank, and depositing shingle on the other. In other instances they suddenly change their channel during flood; and in well-known cases have entirely abandoned cities built on their banks. Where the work to be supported by a well-foundation is of a permanent and solid character, as in the case of a viaduct, it is possible to make perfectly sure of the foundation by the construction of a proper number of these shafts, although they do not penetrate below the sandy strata. But in hydraulic works the case is very different. In the works for the barrage of the Nile the operations of the engineers were so hurried by the childish impatience of the Egyptian Government that the sinking of the foundations was arrested before reaching solid ground. The material passed through was a fine silt, and there is reason to suppose that at least 100 ft. in thickness of this material had been deposited by the river in the course of ages at this spot. Thus the bottom of the foundations of the barrage works is some 60 ft. above the rock, or solid soil. This is all very well, as we have just remarked, in order to support a solid and unchanging weight. But it is another matter when the tremendous pressure of the Nile flood has to be resisted. The consequence of this haste or false economy has been, that the engineers have been in fear lest their entire work should be blown up by the pressure of the water. This would unquestionably have been the case if the barrage had been carried to the height originally intended. The sacrifice of head which it has been necessary to make in order to secure the stability of the barrage works has accordingly been so great that the benefit derivable from the same has been reduced to exceedingly modest dimensions.

In the case of the Havre breakwaters the mode adopted of sinking to the solid has proved perfectly successful. The spaces between the pillars formed as before described were successively excavated, under the protection of sheet planking, and filled up with concrete. Thus a solid concrete wall was built in instalments, and absolute security was attained by a cheap and ingenious method. The cost of excavating the whole trench required for the wall, on the old plan, by means of a coffer-dam, or continuous sheet-piling, with the constant employment of powerful steam pumps to keep down the water, would have been very great. The risk would also have been considerable, unless abutting piles had been driven, and the entire area opened had been protected in the most substantial manner. The sand was so quick that in some places it was necessary to caulk the joints of the planking placed between the pillars. In passing the site of the old fortifications, which had been destroyed in order to allow of the enlargement of the port, special difficulties arose. In order to obviate them, the shafts sunk on these spots were constructed of brickwork on three sides only, the fourth side being planked. This adaptation of new means to a definite end proved successful; and no accident occurred in carrying out this novel and arduous piece of work. Three pumps, each driven by a movable steam-engine, were employed for keeping under the water, and the total quantity of water thrown, to a height varying from 16 ft. to 43 ft., was estimated at upwards of 21 millions of metric tons. This is allowing four metric tons per minute for each pump; the total number of hours employed in pumping having been recorded as 89,718. The marvellous detail with which the French engineers record every incident, the numerous items which go to make up the schedules, and the exercise of a constant supervision of the smallest points, are subjects of astonishment to the English professional man, when he first becomes acquainted with the foreign practice. But the admirable exactitude of the statistical returns which are thus rendered possible is enough to make up for the extra trouble. It is certain that the labours of the French engineers are not only very efficient for the execution of the works they design, but also of extraordinary advantage to their professional brethren elsewhere, as preserving the most instructive details both of practice and of cost.

ROYAL ACADEMY ARCHITECTURAL LECTURES.

ON Thursday last, Jan. 31st, Professor E. M. Barry delivered the first of a series of lectures which we shall print in full, as we have done on all former occasions. In our present issue we confine ourselves to his prefatory observations, which referred to

THE LATE MR. SYDNEY SMIRKE, R.A.

Before commencing my first lecture of a new series, I desire to pay a tribute of respect to the memory of one who but lately occupied an honourable position within these walls, but whose place is now vacant amongst us.

Since we last met in this room death has taken from us Mr. Sydney Smirke, who formerly occupied the chair which I now fill, as his unworthy successor.

Mr. Smirke bore a name distinguished in architecture, being the younger brother of the late Sir Robert Smirke, an architect of great reputation, and a Royal Academician. He was educated for the profession, and became also connected with the Royal Academy from an early age. His name appears as Gold Medallist in 1819, when he was about twenty years old. He afterwards obtained a large professional practice, and the architectural works which he has left behind him are both numerous and important. He was a witness of the Gothic Revival, but not a very active worker in that direction, although several tasks of magnitude

were entrusted to him. I may allude particularly to the restoration of the Temple Church (as to which work he was associated with Mr. Burton), and that of the Savoy Chapel. He also executed some Elizabethan buildings, with others in a Late Gothic style, for the Society of the Inner Temple, and carried out other works of less importance in the Revived Mediæval architecture, which had become favoured by the public.

The course of Mr. Smirke's studies, however, combined with the traditions of his family, and his own natural taste, led him to prefer the Classical forms of the Renaissance architecture of Italy, a good specimen of which is to be seen in his design for the Carlton Club, Pall-mall. His completion of the British Museum, which had been left unfinished by his brother, and his design for the great reading-room, illustrated at once his constructive skill and his artistic feeling. The same remark applies to his works generally, whether those executed in conjunction with others, as the Conservative Club in St. James's-street, and the Oxford and Cambridge Club; or those buildings for which he was more fully responsible.

Mr. Smirke was held in the highest honour in his own profession, as is proved by the award to him, in 1860, of the royal gold medal, by the Institute of British Architects of which he was a fellow. A distinction which was equally prized was conferred by the Royal Academicians, when, on the death of Sir Charles Barry, they nominated him their architect, to design the new home of the Royal Academy, in Burlington House. How well Mr. Smirke acquitted himself here we all know, and you see around you his worthy monument. It was his last professional work, and, devoted as he was to the welfare of the Royal Academy, he would probably have wished it so to be. He had filled the chair of Professor of Architecture, with the offices of treasurer and trustee, and the great aim of his daily work among us was to deserve and enjoy the confidence and regard of his brother artists.

On the completion of the Academy buildings, Mr. Smirke retired from office, and sought the leisure of a well-earned retirement. He died in 1877, at the age of seventy-eight, after a distinguished and useful career. It has been said that there was a hesitation in his manner, approaching to coldness; but although this may have so appeared to strangers, those who knew Mr. Smirke were well aware that beneath such apparent reserve, there were warm feelings, a sensitive nature, and generous ideas. Trusted by all who had to do with him, he was emphatically a man of honour and of culture, deserving of the highest confidence. Patient and painstaking, he was ever anxious to do his best, in whatever he undertook. Possessing a refined taste, and a cultivated mind, he shrank from all that approached exaggeration or vulgarity, whether in art, or in society. One of the small band of architects who are members of the Royal Academy, Mr. Smirke was always anxious to do all that was possible to further the interests of his favourite art, by extending the benefits of our schools to the students of the profession generally. He took a warm interest in the establishment of the Architectural School on its present basis, and in all that related to the course of study therein.

His name will ever be held in deserved honour within these walls. He is gone from us, but his works remain, and his career may well serve as an example, as well as an encouragement, to those young men who are now at the threshold of their professional life.

Well will it be with all of us, if, when for us too, the darkness comes, and the shadows lengthen, we can look back on a past life as honourable, and as void of offence. In the meantime, we may, at least, lay our offering of affectionate respect on the tomb of one whose memory is yet green; of a departed friend in whom we mourn a skilful constructor; an accomplished artist; and a Christian gentleman.

Metropolitan Water Supply.—On the 18th ult. a meeting of delegates from the vestries of the metropolis was held at the offices of the National Chamber of Trade, 446, Strand, to take into consideration the Bills introduced into Parliament at the instance of the Metropolitan Board of Works with regard to the water supply of London. Mr. Attenborough presided, and a long discussion ensued.

A BOOK ABOUT ORGAN-CASES.

UNDER the title of "The Box of Whistles," is published an illustrated book* on organ-cases,—not a book of new designs, but illustrations of existing organs, mostly among the old and celebrated instruments of Germany. The author is quite justified in saying that he is occupying new ground; but the book is very disappointing, and deals in a very slight and unsystematic manner with a subject which, for the very reason that it has been neglected, was worth treating much more thoroughly, if at all. We object to the title to begin with. There is a catch-penny look about it, and it is not suitable in a book written in honour of a grand instrument to adopt the name given to it in derision by a (musically) barbarous nation; and the author does not seem to have any settled purpose in his book, or to have made up his mind for whom he was writing. He goes occasionally into little matters about organ-building, but in a way that is too slight to serve any purpose. His illustrations are of little value to architects, for the details of the designs are not sufficiently well shown. In his concluding paragraph it does seem to occur to him that his notes are not very systematic; they are, he explains, simply the result of sketches and notes taken at different times. If the book had been called "Sketches and Notes on English and Foreign Organ-cases" its title would have been a better index of its contents, and the illustrations might then have been confined to sketches and details without colour. But an attempt has been made to get up a showy book without sufficient basis to go upon, by means of large and coarsely-executed chromolithographs, the colour and detail drawing in which are such as to be quite annoying to artists and architects. They will just do to make a picture-book of organs, for people who have no knowledge of the subject to turn over; and the book will perhaps serve to remind some amateurs of the organ how much elaboration used to be spent upon the old cases in comparison with the bare stand of pipes which we are too often content with now. This is the one point perhaps in which the book may have a practical result. The author generously observes that he will be amply repaid if his work "in any way tend to the improvement of the organ"; but it is difficult to see in what way it could do so, since it is little more than a representation of organ-cases picked out by chance, and many of which, however interesting, are extremely faulty and even vulgar in design, when regarded from an artistic point of view, and could not by any means be held out as models.

On the one point just referred to, however, we are glad to read Mr. Norbury's remarks, and to endorse them,—in favour of making the organ-case a regularly designed and complete architectural structure, and not a mere frame filled with pipes. With him, we "look upon caseless organs, with their rows of painted pipes, as something horrid." The organ in its finest form is, as he says, an instrument which gives pleasure to three classes of individuals, the musician, the mechanician, and the architect. As to the second point, it is somewhat curious to note that most private persons who are able to indulge in building an organ for their own use appear to care much more about the mechanism than the tone. As to the architectural interest, Mr. Norbury quotes the remark of an artist in Paris (name not given) who said that the price charged for "les auditions particulières" of the Haarlem organ was well worth paying, if it were only for the sole pleasure of admiring its magnificent exterior. And this is as it should be. The organ differs from every other musical instrument in that it is not a mere piece of furniture, but an erection,—a thing built up like a palace; and it is as worthy of high-class and sound architectural design as a building; and, in fact, offers an opportunity to the architect to indulge his fancy in a way much less trammelled by practical requirements than is commonly the case in his work. The habit now is to dispense with the architect, as a rule; to put the pipes up in naked and unsightly rows, and then to let loose a decorator upon them to cover them with colours like Harlequin's coat. How vulgar and tawdry these cases look in comparison with some of the old English and German organs, with their stately architectural design and sober gilt pipes, it is hardly necessary to point out.

At the same time, there are certain general principles not to be overlooked in this architectural treatment of the organ, and which our author is silent about. He has some notions about "flats" and "towers," in an empirical way; and he likes to see statues on the tops of the towers, "though of course they are a useless expense." For such a position "angels with trumpets and harps are excellent." So they are in old-fashioned organs, where people put them in a semi-childish spirit, and with a naïve sort of belief in angels whose habitual occupation was harp-playing; but it is hardly worth while to do that sort of thing over again in these days. Figures, if introduced into a modern organ-case, should be rather for beauty than for mere symbolism; and should present really artistic feeling and individuality, and not be carved perfunctorily to fill up a situation, which is sure to be the result if it is agreed that figures are "the right thing"; organ-builders would be quite capable, in that case, of keeping angels "in stock" to stick about their instruments. Then there is the question of the employment of the pipes as part of the design. We quite agree with the author as to letting the organ be seen as an organ, not shutting it up behind an ornamental screen that gives no indication of an organ, which has been sometimes done. And large organ-pipes, of good metal, are fine pieces of work in themselves, and combine exceedingly well as parts of a quasi-architectural design, giving powerful vertical lines to the composition, and imparting to the whole design also an apparent voiceful power quite different from the effect of a mere screen of dumb wood-carving. Let the pipes, therefore, form part of the design, let the organ appear as an organ; but in doing this do not let the practical considerations be overlooked.

It may be taken as agreed that sham-pipes are an abomination not to be thought of. But in that case the real pipes must not be placed so as to convey to the mind of any one who knows the construction of an organ that they are shams, or, at all events, are far out of their right place. Some time since we called attention to this point in an article on the architectural treatment of the organ.* We reminded designers of organ-cases that it was desirable that pipes used in the front design should be so arranged as to stand as near as possible to their natural place in the instrument; and that when the pipes are taken "far from their wind," extra complication and extra chance of leakage and failure must result. And we drew attention to the fact, which we here repeat, that the natural and universal arrangement of a large organ by the builder is with the larger pipes at either side, and the smaller ones in the centre, and that, therefore, a design for a front with a large centre and low wings is not only liable to involve inconvenience of arrangement, but is artistically bad as contradicting the facts of the construction. This point was, for the most part, kept in view by the older designers of cases, and the majority of those shown in Mr. Norbury's book have the larger towers at the extreme angles of the front. Where, for architectural reasons, a central or pyramidal composition is desired, it is possible to secure this in the general treatment of the design: this is very ably done in the case of the Haarlem organ, where the angle towers containing the largest pipes are nevertheless kept low, and the centre raised in a very effective manner without taking the larger pipes out of their places to secure it. Some of the smaller ones, however, seem to be mounted much too high, and must either be shams or be very inconveniently placed in a practical point of view. This is a criticism which would apply to a good many of the most striking designs engraved in this book, the Continental ones especially; and it is one which architects who are called upon to design organ-cases should bear in mind. A very rich and suitable *appearance* is given to a large case, no doubt, by inserting groups of small pipes in out-of-the-way nooks and lofty perches all over it; but this effect is only pleasing to those who know nothing of the interior construction of the instrument: as soon as we know that these little groups of pipes must either be dummies, or must be got into that position at a great disadvantage to the mechanical arrangement of the instrument, the device becomes an impertinence, and ceases to please.

* The Box of Whistles: an illustrated Book on Organ-cases, with Notes on Organs at Home and Abroad. By John Norbury. London: Bradbury, Agnew, & Co. 1877.

* "Notes on Church Organs": in the *Builder* for October 23rd, 1869.

The older organs, Continental especially, had a great source of effect now nearly abandoned, in the practice of making the pipes belonging to the lightest manual (*choir-organ* in England, *positiv* in Germany) form a visibly separate organ: a small instrument in front of the larger one. Hardly any arrangement of an organ can be so effective as this combination of a large and a small instrument, the latter forming a kind of echo of the former, and aiding so greatly in giving scale to the whole; and the arrangement is a really practical one, bringing forward the light bright stops which are used to accompany the choir, so that their sounds are as clearly and distinctly defined as possible. The only disadvantage was to the organist, who, thus sitting between the two instruments, was doubly boxed up, and prevented from properly hearing his own effects; but this might easily be remedied in the case of new organs, where a different arrangement of the keyboard can be made. The practical value of this dividing of the light portions of the organ from the heavy parts is beginning to be felt in dealing with new organs for our cathedrals, the modern instruments being too large to be placed bodily on the choir-screen in the old position. Thus in the recent re-arrangement of the interior of Chester Cathedral, though the principal part of the new organ has been erected in the transept, a small case was erected on the choir-screen to contain the lighter portion of the choir-stops,—a matter of absolute practical necessity, as, without bringing some of the organ near to the singers, it is often impossible to keep them in tune with the instrument. Another point in the treatment of the pipes of the organ in design, which has hardly received any attention, is the use which might very well be made of the large square wooden pipes of the deeper pedal stops, in giving weight and mass to parts of the design and varying its character. The largest of these pipes can be panelled, and otherwise treated with surface decoration, and form a very effective contrast to the metal pipes.

In the majority of English organs, both old and new, the prevalent defect is a squareness and timidity of composition, a want of feeling for variety of plan and multiplicity of effect. The contrast between even the best of the older English cases and the Continental ones in this respect is very noticeable; it must be remembered, however, that the Continental designers had the advantage of a much larger scale to work upon, all the older English instruments being of comparatively small size. The treatment of the pipes in groups or "towers," circular or lozenge-shaped in plan, with only small "flats" between, is much more effective than one in which a great proportion of flat treatment is used, with only occasional breaks or projections, which always look tame, besides lessening the scale. A "multitudinous" effect is more suitable, and produces a much more striking result in a great instrument, than a bald simplicity. This multitudinous and piled-up appearance is the source of the great effectiveness of the Haarlem and Hertogenbosch organ-cases, the latter of which Mr. Norbury calls "perhaps the finest in Europe"; the details of both are open to a great deal of criticism, but their splendid and sumptuous effect cannot for a moment be questioned. On the other hand, when an organ is on a small scale, true taste would dictate that the designer should aim at a dignified effect by massing the instrument as much as possible, and not try to give it the appearance of a large instrument by cutting it up into too many minute portions. In this respect the comparatively small organ in St. Magnus the Martyr's, which is one of Mr. Norbury's illustrations, is very characteristic and pleasing, though it would be better without the row of pipes in the pediment, which is an obvious sham. St. Sepulchre's, a larger organ, and one of the finest and most celebrated in London, which forms another illustration, presents the anomaly of a capital and strictly logical design in general treatment, with almost the worst and weakest detail possible. It is a pity the author did not give the admirable design of the small organ in All-hallows, Lombard-street, which is really refined and artistic in treatment; he mentions it, we observe, with due praise.

Detail is, in fact, the weak point of organ-cases generally, not merely in regard to style, but in regard to constructive expression and fitness. Purity of style in the older organ-cases is not to be expected, for the instrument grew into being in a period of impure taste; and although organs are spoken of and existed in the Mediæval period, the instrument was then so small and insignificant as to be hardly worth taking into account in comparison with what it afterwards became.* But in the matter of constructive expression both old and modern designers of organ-cases have too constantly adopted certain stereotyped forms, which are false and conventional. For instance, the brackets on which the pipes stand in the illustration of the organ in St. Wolfram's, at Abbeville, represent a kind of detail very commonly used; and in this case, as in so many others, the brackets spring from or stand against a mere panel, without any indication as to how their weight and that of the pipes they carry is really supported. An organ should have its construction at least indicated; it should be possible to understand how it is supported; but the usual object of builders seem to be to cheat the eye by built-up brackets and corbellings, and panelling which conceals the real structure behind a kind of band-box. The support of the whole instrument from the floor (when it does not stand upon the floor) is an important point. The support should appear visibly sufficient and stable, either by columns or by solid brackets. As an instance of an exceedingly bad design in this respect, we may adduce that of Rheims Cathedral organ in Mr. Norbury's book, which stands upon a sham vaulting or corbelling system, made of rib and panel boarding. Rouen Cathedral organ, in the next illustration, is far better, being carried on beams supported by buttresses of masonry carrying stone projecting corbels; if the timber beams were only a little more emphasised, the substructure would be quite satisfactory. The small hanging organ in the nave, at Freiburg-im-Bresgau (not to be confounded with the celebrated great instrument at Swiss Freiburg), is very well supported as far as the main organ is concerned, by a solid balk of timber running longitudinally against the wall under it, and cut to the shape of a corbel at either end; but the choir organ of the same instrument is carried on a wretched panelled sham corbel of joiner's Gothic design. One of the most artistically supported of the hanging organs is that at St. Bavon's, Ghent, which stands over an open arch supported by columns, forming part of the architectural design of the building: the case itself is a very pretty design, though absurdly incongruous in detail, the side towers being supported at the foot by naked fauns, and surmounted by angels blowing trumpets. The little cage of pipes at the top of the centre feature is an obvious sham.†

Mr. Norbury touches incidentally on one or two practical points which, though strictly perhaps matters of organ-building, are sufficiently connected with the architect's province to be alluded to here. One of these is the system which architects, desirous to get the organ reduced to what they consider a manageable size in regard to architectural effect, have recently forced upon the organ-builders, of distributing the large pipes into nooks and corners of the building to get them out of the way. He just mentions this, in passing, in regard to the Chester organ, where the large pedal pipes have been put on the ground at the end of the transept, where, as Mr. Norbury rightly observes, they are very unlikely to be effective; and we drew attention some time since to the same mistake at Worcester Cathedral. It is quite a different thing from placing the choir-organ separate from the rest of the instrument, because in that case the separated portions are intended rather to contrast than to combine; but to split up those parts of an organ which are intended to form a homogeneous whole, and scatter them about into corners of the building, is ridiculous, and we must plainly say that architects have no right to get over the difficulty by spoiling the instrument; their duty is to see how a large organ can be effectively treated as a whole, not to cut it up into bits and get rid of it in that way. Mr. Norbury is wrong in his idea that no one is agreed as to the best arrangement of the pedal-board; he will find all first-class players are unanimous in favour of the radiating pedal-board. It is worth remark, as an instance of the utter want of common sense in regard to some practical matters in organ-building, that not only is there no common scale or make of pedal-keys agreed upon among builders, but even the same builders will make pedal-boards of the most varying scale and plan in different instruments,—a fact which will probably astonish some of our friends who are not familiar with organic mechanism. What would be said if in every house you were liable to be asked to play on a piano with keys of different size and shape from the last you handled? There would almost be a demand for an Act of Parliament to rectify the confusion. Mr. Norbury is wrong in his objection to another improvement, that of bringing the keyboard away from the organ and reversing it so that the player faces the room. In the present state of mechanical skill in English organ-building, the carrying of the "movement" under the player's seat is no real difficulty and only a slight extra expense, and the advantage and comfort to the player in sitting away from his instrument and facing the audience, instead of sitting almost *in* the organ, as he generally does, are very great, more especially when it is a question of following a conductor; Mr. Norbury is quite mistaken in thinking that it is as easy or comfortable to do that "through a glass darkly" as "face to face," as any one who has tried it could have told him.

The author was justified, from his point of view, in passing over with a mere allusion some of the large organs of England which he names. The Albert Hall organ can scarcely be said to have a "case" at all, and that of the Crystal Palace organ is simply hideous; but he ought not to have passed over without a word the great organ at Liverpool, the case of which was designed by Cockerell, and, though open to criticism, is one of the best of large modern cases, and contains very fine and original points in design.

Though not able to say much for Mr. Norbury's book *per se*, we have thought it worth while to make it an excuse for giving a little space to the subject, as it is one of some interest, not often handled, and a good deal misunderstood, owing to the reciprocal deficiencies of the two classes of persons most concerned in it; organ-builders in general knowing nothing of design and architects very little of organ-building. If the two would put their heads together a little more, we should probably see something better than we generally do in the outward form and features of our church and concert organs.

* We gave an illustration (in the *Builder* of December 9, 1871) of a very fine Gothic organ-*loft* from St. Pantaleon at Cologne. But the original organ was no longer in existence.

† The organ at St. Bavon's will have a special interest for some readers through its association with Adelaide Procter's beautiful poem, "A Tomb in Ghent."

AT THE TOP OF TWO TOWERS.

One misty morning, last year, at the momen when, according to all veracious almanacks, grouse-shooting begins and the session of Parliament ought to end, we stood at the foot o Westminster Clock-tower. The "Story of the Government Offices" was in our pockets; we sought fresh inspiration within the very precincts whence her Majesty's printer gets most of his "copy." The mist which, London-like, had degenerated into a fog, was so thick that no mortal eye saw us pass a little door, evidently left ajar for the workmen who, up above in the clouds, were repairing and brightening; and for whose use a great scaffold had been erected. The cracked bell, that had called so many Royal Commissions and Select Parliamentary Committees to abortive labour, was silent; and the hour of our trespass cannot be known. To follow the winding stairs, and afterwards to cling tightly to each easy ladder, was all we had to do,—though the work was hard enough,—to reach the mimic leaves of the huge gilded finial. There, however, all was obscure: fog above and around us, fog below. Every workman had fled; not a solitary body could be found. Yet we heard voices! One a gay, light, cheery, laughing voice; and another, heavy, pompous, priggish.

"*Sacre bleu*," said the former, "your Majesty hath all along argued in favour of absolute power; you forget, Georgey, the terrible responsibility of initiating reform,—the danger of pronouncing an irrevocable DO this, or DO that."

"By no means, Charles; but I do maintain that, without having had the opportunity offered me, I improved the West of London. You had the chance, literally thrown at you, of re-arranging the entire City; but your Majesty was weak enough to build the new streets on

heir old lines, and the new houses on the old foundations."

"That's true, but my people were burnt out; they were houseless and could not wait for plans or schemes of alteration. I acted constitutionally, and neither Wren nor Evelyn was of the number of my ministers; they were, therefore, not competent to offer me advice. Your Majesty, dear boy, would have found other things to do than talk architecture, had you lived at Whitehall."

"Nevertheless, my dear Charles," said the other voice, "I must impress upon you a fact which is now patent to me. Where there is no responsibility, where the duty of doing something is divided among a dozen people, the man of action will not risk life or reputation merely to share glory with the inactive eleven, or enjoy unappreciated death alone."

Aghast, breathless, yet eager to catch every word, we had enough presence of mind to ask ourselves the names of these potentates. Impossible to doubt that one was Charles, the Merry Monarch; but the graver voice, could it be that of George, Prince Regent and Rex? If so, the purgatory of fog, in which both the kings were enveloped, must have exercised an influence difficult to explain.

"*Eh! bien, donc,*" continued Charles, "you would rule this unhappily prosperous country otherwise than you did if Fate gave you another fling. *Voyons, cher,* none have denied that I was a thoroughly constitutional sovereign: I did nothing myself, and I left everybody in the land free to do the same. A 'God bless you, my old friend,' given heartily to every lord, squire, and tradesman a king encounters is the secret of regal popularity; and I was successful."

"And I, too,—I was not the fool that Thackeray said I was," rejoined his companion. "I took Louis XIV. for my model, and, damme, sir,—there is no harm in saying damme now, Charles,—I made a road right through London from Carlton House to my park at Marylebone, just as Louis did from the Tuileries to Courbevoie."

This was indeed the king who, in youth, cried out "Wilkes and liberty!" in his father's closet; and who in age believed he had led the Life Guards at Waterloo. That purgatory should sharpen the wit, we do not say the judgment, of men, raised a new sensation within us.

"Nicely you bungled over it. Your Royal Highness's sewer was made in a straight line and the Regent's Street in a curve, so that the big drain ran under the new houses and not the new street. Your Majesty's 'Courbevoie' began at Swan & Edgar's, the French king's road ran for three miles in a straight line."

"True," said George IV., in a tone betraying annoyance, but still as full of dignity as before, "I accept your Majesty's just reproach. But since my time no one has done so good a service to the town as I did, and with my own money too. At the present hour, a large part of our estate, where your Majesty's palace was, for instance, is a mere waste. No revenue comes from it, and Parliament laughs at it. Had I deemed it useful, I would have dropped my Niece a hint, but the Crown is not now interested in its own property. The nation pays the sovereign a fixed sum, and whether our estate pays or does not pay is quite immaterial, to judge from appearances, to both sovereign and nation. If I had to rule England again, I would treat London as Louis XIV. and his grandson treated Paris, and as, a hundred years after, the third Napoleon treated the splendid capital."

"*Parbleu,* do you remember our visit during the glorious days of July? Ha! Ha! Ha! I know a little about blessed restorations, and can understand the French difficulty. However, when you and I were in Paris, Georgey, in 1830, think what the Place Louis XV. was like,—it's the Place de la Concorde now: a sea of mud when it rained, and a desert of gritty sand when the sun shone. Between the Tuileries and the Louvre there were streets of closely-packed houses, booths, and shops."

"Yes," said George IV., "thanks to Louis Napoleon and the artistic character of the municipal organisation he developed, a Republic is now able to do with ease what he, an autocrat, had, at first, difficulty in accomplishing. If I were Regent again, I'd snap finger and thumb at the landowners, encumbered leases, and all that sort of thing. I'd tell my Lord Beaconsfield to carry a Bill of Expropriation for Public Utility, and pension him off if he failed."

"Shilly-shally, dilly-dally," laughed the Merry Monarch, "if half only of the money absolutely wasted over Foreign Office diplomacy were transferred to the use of the Home Office, they would have more than enough to improve all the cities of Great Britain and Ireland. But London, which has teeming questions of life and health at each point of the compass, could not exist without its free press; and what would a daily journal do without an Eastern Question?"

"The fact is, Charles, no improvements can possibly be made until some determined person takes the matter seriously in hand. Boards and Committees are all very well to go through the form of ordering a competent official, who knows how to manage them, to do what is right and proper; but any hope that Boards can initiate, or do anything of their united free will, is absurd. British method is half a delusion. On the surface it is a republican system, with a monarchical head. But if any one takes the trouble to inquire, great things have been done in England ONLY when some subtle person has guided and governed events as an absolute monarch, under cover of republican forms."

We were more and more impressed with the change that an æther of purgatory had occasioned in the first gentleman (of his day) in Europe. We even prayed that several officials, now in high places, could be similarly directed on the road of amendment.

"May it please your Majesties," we ventured to utter in trembling accents. There was just a flutter of wings, and a voice somewhat reservedly pronounced a harsh "Speak, mortal."

"May it please your Majesties to say how an earnest reformer should begin?"

"You must hang some one," said Charles, laughing.

"You must use measures of a determined character," said the other. "You must expose those interested in keeping things as they are, and you must take from them, at the risk even of being unjust, the power they unscrupulously wield to obstruct."

"Behead the Chief Commissioner and hang the Chairman of the Metropolitan Board, just to give the people a taste for further—ahem—sacrifice."

This seemed too dreadful, but one gets used to everything. "Does your Majesty think," said we, turning to Charles II., "that would not suffice?"

"Oh, no," cried out both the monarchs in a breath.

We started at the ominous negative.

"If I chose to exert myself," said George IV., "I could tell John Bright how to do the country a good turn, and make his last days better even than the first. I respect Bright; and, on his way up, one of Edward Hyde's descendants did not hesitate to say how he admired the great and good champion's simplicity. John Bright ought to lead the party of municipal reform. Were I still king, I would send two or three of the English obstructionists to govern some of the more peaceful islands in the Pacific."

"*Allons, cher ami, vous allez trop vite. Savez-vous les Anglais ne sont contents ni de vous ni de moi.* They pulled down Carlton House and did not rebuild it; Whitehall was burnt down, and they have left the site half a slum, fashionable and official if you like, but still, comparatively speaking, a slum. *On ne veut pas, aujourd'hui, se souvenir de nos petites dames et de leur postérité aggrandie. Et cela ne m'étonne point.*"

The voice of the Stuart dropped slowly during the whole of the last speech, for the fog had lightened. The Guelph, with his strong British accent, unlike that of his companion who had known the European world, called out "*Au revoir*"; but our sight was no longer blinded. A panorama of houses and streets lay beneath, and, in spite of the strange conversation we had just held, we knew it to be the capital city of Victoria, our Queen.

The fog had lifted; masses of grey and brown were hanging in the heavens. The sun, just powerful enough to shadow the Embankment and the bridges, imparted a suspicion of life to the dirty windows of houses in Parliament-street. We tried to recall the appearance of Westminster, when King-street was the sole approach to it from Charing-cross, and when two huge gate-houses spanned the former at Whitehall and at Downing-street. Then glancing northwards, our eyes stumbled, as it were, upon narrow, irregular St. Martin's-lane and back again to the remaining portion of narrow, irregular King-street. Whence is derived that peculiarly native genius for doing things by halves which, at intervals of a century, is conspicuous in the order of Metropolis Improvement Acts? To improve the approaches to Westminster and the Abbey, it was deemed expedient, not to widen and straighten the sole existing approach, but to open an entirely new one. Parliament-street thus became the high-road; King-street was relegated to the condition of a mere by-way. Instead of gaining by the improvement, it fell lower still into a state of half-slum, for many years the chosen haunt of the recruiting-officer and his prey. An almost similar fate awaits St. Martin's-lane. Instead of continuing the widened opening and improved alignment, begun during the earlier years of this century,—when Trafalgar-square was laid out,—the new main thoroughfare from Charing-cross to Oxford-street is to deviate to the left, behind the National Gallery. Thus the old historical lane, which joined the two churches in the fields, will become a by-way, and the squalor of the Seven Dials, likewise unimproved, descend to the very mouth of the new street. As these reflections crossed others, we turned towards Victoria-street. So great a thoroughfare seemed to be poorly led up to. Originally intended as a West-end approach to Parliament, it bears the miserable stamp of failure. Its borders in parts are still barren of buildings,—ay, even after twenty years. Here and there intrudes a shop between blocks of offices, warehouses, dwellings and a hotel, all blank, dreary, spiritless. A great highway like that ought to form a continuous line of shops. Though traffic depends less upon shops than shops depend upon traffic, good shops increase and induce traffic. But Dulness, in æsthetic enjoyment of the genteel, will not live over a shop. Gentility is content to be victimised, and the family shrine planted, by the British fashion of compromise, in an extravagant "flat," forms a charming sacrifice to native prejudice in a street that cost 300*l.* a yard run. Indeed, the whole street of not much more than a thousand yards cost much more than 300,000*l.* Some twenty years before it was begun Select Committees sat on the means of its promotion. It was this same cutting which, had it been executed in accordance with certain of the innumerable plans of experts and competent officials, might have provided a direct communication between Buckingham Palace and the high roads to Surrey and Kent *viâ* the Horse-ferry; it might also have provided an equally direct highway between Victoria Station and Westminster Bridge. But looking over the pyramidion of the obelisk-model we marvelled at the utterly irregular character of the open space between the Abbey and King-street. We wondered what calamitous custom, or "law," existed to annihilate the splendid frontage towards Parliament-square and exactly opposite the clock tower; we wondered why, instead of the back-door and side windows of a sooty tenement in Great George-street, there could not be busy shops and offices and comfortable dwellings.

The fog had enveloped us again, and the same voices asked mockingly why we stared at Victoria-street.

"I could tell you a thing or two about that artery, as the newspapers call it," said Charles II., "which would make your fortune if you repeated the thing properly. I could show you the way into an action for libel by simply telling the whole truth. As defendant, you would have half England on your side; and it might cost no more than a thousand pounds or so."

Obviously we declined; but we begged to be admitted into their Majesties' confidence.

"During all the years," said George IV., "that they were sitting and reporting about a possible Victoria-street, there was one obstacle that would not budge: it was Beer."

"Ha! Ha! Ha!" interposed the Stuart, "not a scheme for the suggested street was presented—not a Select Committee-man thought he had done his duty until the Oracle had been consulted about the Brewery."

"He! He! He!" slowly chimed in the Guelph, still mindful of his dignity, "it was Elliot's Brewery that helped to make Victoria-street what it is."

Odd coincidence, mysterious revelation, strange and weird-like fact! It is a barrack-yard that stops the way between the Strand and Regent-circus; it is Sir Robert Peel's stable that obstructs the ancient site of Whitehall; it is a row of half-worn-out houses on a patrician estate that impedes action between Trafalgar-square and Oxford-street; it is the "Argyle" that frightens the Metropolitan Board in an

attempt to connect Regent-circus with St. Giles's and Holborn-viaduct; it is an old lease that prevents the widening of Abingdon-street; and it was Elliot's Brewery that spoilt the great Belgravian approach to Westminster.

"*Coquins d'Anglais, va!*" cried Charles, "you are little better than the worst Frenchmen, even at your best. When I was king, the *grands seigneurs* used to make a purse now and then for themselves, but when the time came they paid a great deal back with their lives in defence of their country and the people. Nowadays it is the people who, under the item, Contracts, rob themselves and each other; and when the German is at their gates, are unwilling or unable to fight for their own hearths and homes. They made boots with paper soles for their fighting-men, and the soldier broke open the commissariat wagons. The mayors of the Commune sold the English gifts after the great siege at a profit, and . . . ."

"His Majesty's memory and observation are excellent," interposed George; "but what has that to do with our metropolitan alterations?"

"You shall see, *cher*," retorted Charles, "to what my homily tends. That same quality of patriotism has a wider range and application than the mere defence of oneself against a foreign enemy; it concerns the defence of oneself against oneself. Is there not patriotism in rendering, at self-sacrifice, a City and a Metropolis, not only the worthy Capital of a great Empire, but worthy also its proper place in the world? Do land-owners, house-owners, shopkeepers, and tenants of all kinds, think you, care a rush about improving London if they happen to be luckily placed on a threatened line of demolishment? Even when amendment lies easily within their power, they decline to do any, even the least, thing for the public good. Look at the Honourable Society of Lincoln's Inn; they are rebuilding on the west side of Chancery-lane almost on the old lines; they are totally careless of the public convenience, or even of the advantage, in a crowded narrow street, of straight lines and right angles. I was a fair limner myself, Georgey, and know something of draughtsmanship. The town is cursed with the greed of professional obstructors. Money, sir, is what they want, and everything on the London soil, even to an ancient light, is reducible to sterling coin. 'Tis not enough in England to improve a man's property, he expects you to pay him for having improved it. Ah! for the English to revile the French about patriotism is to repeat the old parable of the mote and the beam."

"My dear Charles, you are incorrigible; some years ago they passed an Act, was it not called 'Cross's Act?' And George, fourth of that name, condescended to do more than smile at his own wit. His brother monarch roared with merriment; and the purgatory of fog bubbled, so to speak, into a general cachinnation, dispersing the clouds within which we had been concealed.

Our eyes fixed in the direction of Victoria-street, covered the Abbey, the entrance to Dean's-yard, and the Westminster School. We recalled the fact that the school is about either to be removed altogether or rebuilt near its present position. Surely, then, a possibility of improvement is at hand. We were thus reminded of the many forgotten plans and projects for ventilating the south side of the Abbey; and we could perceive, from our eminence, that a street connecting Buckingham Palace with the Royal entrance to the Palace of Westminster was not only desirable but absolutely feasible. To more than one architect, and to more than one projector, is due the credit of having suggested and laid down the lines of such a street. The thoroughfare might run in a straight line perpendicularly with the alignment of Old Palace-yard up to the junction with Victoria-street. The houses on each side of Orchard-street would thus be absorbed, and the new street could run, without destroying any really Mediæval building, through Great Dean's-yard, alongside the condemned Westminster School, to the very centre of the Victoria Tower. Health and energy would thereby be introduced into the nest of inclosed courts and alleys that block the Abbey and cloisters on the southern side. The continuation of such a new and useful thoroughfare from Victoria-street to Buckingham Palace would be a small affair. The way is already made, only the alignment requires straightening. It would cross Victoria-street obliquely, and connect the palaces of the Sovereign and the Legislature almost in a straight line.

The monarchs returned in the clouds gathered again about us. Reading our thoughts, Charles II. hinted that our expectations were exorbitant, for only seventy years had elapsed since Reform cut into the Abbey and the old Palace, and it was barely 130 years since Parliament-street was made.

"You must wait," said the king, "at least a hundred years yet. Meantime get Whitehall rebuilt, and put your new Public Offices there; you will thus begin the picture of London Improved, as it ought to appear from the river."

"And pray do not permit them," continued George IV., "to waste any more money in buying land between Charles-street and Great George-street. Both his Majesty and myself would prefer to keep those streets as they are. Let them absorb King-street if they choose; but do not buy more land there than is absolutely necessary to make a decent frontage of Government buildings to Parliament-square and Parliament-street; for perhaps you are not aware that the land in question is now *officially* increased to more than double its real value."

"And don't, whatever you do, go in for Gothic," cried Charles II., looking hard at George IV., whose equanimity instantly forsook him. He was thinking, no doubt, of Strawberry-hill and the Brighton Pavilion.

"Nor with the new Renaissance," replied the Augustus of Carlton House magnificence, recovering himself and frowning sternly at Charles, who muttered,—"Sister Anne, sister Anne!"

"By-the-bye, mortal," said the master of Whitehall, "have you been to the new Bow-and-Arrow Tower?"

We turned aside to conceal a smile at his Majesty's ignorance of life in the year 1878.

"Come, lean on my liver-wing," laughed the king, good-naturedly; "and I say, George, give him a lift with your near leg."

Before we knew where we were, or what we were going to do, we were in mid-air. The London atmosphere, of mist, steam, smoke, and tobacco, prevented us from seeing the carts and carriages in the streets, nor could the passers-by see us.

"*Tiens, c'est ici.*"

After experiencing a slight jolting, we found ourselves under the open point of a Mediæval tower. Down below, there was a hoard; and other rough woodwork seemed to show that a siege was expected, or perhaps it had just taken place.

"There's where they shoot the arrows," shouted the merry monarch, "and here's where the archer looks down to see if he has killed his man. Oranges and lemons, the bells of St. Clement's. . . . ."

Sure enough, the steeple of the Dane was at a little distance; we turned round, and the lantern of St. Dunstan shone obscurely. Gracious powers! we are at Temple Bar!

"Now you know where you are," interposed George, "the Bar is below, only the heads we kept there have been sold to Guy's Hospital. Would you like to hear what an old emperor said to me about it? I think his name was Justinian."

"No, no, 'twas Constantine."

"My dear Charles, the renegade Constantine has never got up as high as this; 'twas certainly Justinian. He told me that Fleet-street and the Strand reminded him of what he had heard about Rome, a hundred years after the Gothic invasion. Coarse as Temple Bar is, Justinian compared it to an ancient Roman monument; he thought it looked even refined by the side of its rising and aggressive neighbour. Nevertheless the emperor liked the new Palace of Justice, because he hates London; he said it was pleasant to be reminded thereby of France, Venice, Spain, and Constantinople, and, looking on the Law Courts, to turn his back completely on a city of blacks and vested interests."

"He was wrong, Georgey, for inside it's all English. They have the sash-windows that I introduced, blank cemented walls, and the old deal boards that used to worry me at Whitehall. They have a corridor running the whole length of the building with a window at each extremity."

Nettled at this bit of royal criticism from a constitutionally-careless sovereign, we ventured to correct his Majesty's judgment. "Sire," said we, "this building is in the Gothic style of architecture; its external elevation is the faithful index of its internal plan. Each petty detail is the stern reflexion of a true principle. The accidental projection of a gablet; the raised and hipped roof, pointing to heaven; the rounded turrets at each angle, supported upon and crowned with stone, are all things of absolute use as well as undoubted beauty. The remnant of your Majesty's Palace of Whitehall is a sorry sham——."

"Silence, miserable sinner! You never saw Whitehall, nor the beauties it concealed. I countenanced no shams; but I was too fond of happiness to forego the pleasure of being well deceived."

"Quite right, Charles, for when I built the Pavilion,—you remember Brighthelmstone and your prawn breakfast,—I made no pretence of principle. It was a whim, and it pleased me. What's the good of being a monarch if one can't execute one's whims, and can't be always pleased?"

"Your Majesty hath spoken well," said King Charles; and he remembered, perhaps a little late, the dignity he could so well assume. "It hath long seemed to me that a word from Victoria had set these mortals by the ears. I would not have countenanced the shams that have been audaciously perpetrated above the very effigies of my martyred father and most loving sister. Mortal, look at those stone turrets: no windows light them, no doors open into them, yet they are hollow, and built of strong, thick stone walls. They sustain the weight of no wide arch; they are the counterforts of no heavy roof. Creep, wretch, behind that gable with the many windows, you will find the sloping timbers of the roof dividing obliquely the supposed rooms those windows light. That opening filled with fancy-wrought glass is the window of a granary in which not even grain will ever be stored; across it, and close to the glass, are laid timbers entirely unlike, in slope or shape, the external outline of the gablet in which the window lies. This architecture is one of many beauties and of many delightful surprises. But he who hath the boldness to maintain each surprise to be necessitated by circumstances other than a capricious inclination for the picturesque, is more valorous than discreet."

At that moment George IV. poised himself upon one of the lofty gables fronting Bell-yard. The king's foot rested on a carved finial, which, to our perplexed vision, seemed disproportionately heavy. "We have not brought you here," exclaimed the monarch, with stern emphasis, "for the gratification of an inherent desire to find fault,—the curse of critics,—but to show you the path of duty; to enjoin you not to quit that path until the goal be reached and your duty be done. How many years, think you, have elapsed since Alderman Pickett laid the inhabitants not of Fleet-street and the Strand alone, but of all London, under an obligation?"

The fog was clearing; we were thus enabled to get a sight of St. Clement's Church, which in Alderman Pickett's time had been barricaded with old dilapidated houses. The houses were gone, but the ground on which they stood did not seem to be of much use even now,—the spot is not much better, hardly any cleaner, than before; nor is the road between the church and the Law Courts much used by carriages. The Act of Parliament passed in the forty-sixth year of the reign of George III., and which referred to five earlier Acts of the same purport having the same purpose, provided for the raising of sums of money "to widen the entrance into the City of London near Temple Bar." Powers were then given to dispose of buildings by way of lottery; there were three lotteries, and no tickets were to be sold until the new buildings were completed. Three years afterwards, that Act was amended and enlarged by another Act. The two first lotteries had already been drawn; the third was not drawn till 1811. Of course it is terrible to think of improving the town by the aid of lotteries; but, at least, those lotteries had some method about them. At the present day Metropolis Improvement is an unorganised lottery, about the results of which no one is certain, and in the conduct of which no one believes. Of the character of the new buildings that are to face the Law Courts, of even the frontage line they are to take, is anything yet known? Is there anybody to say to the owners, "That is your frontage line, please to keep to it"? Nor since St. Clement's was cleared has anything been done to remove the obstructive houses

between that church and St. Mary's. Forty-two years ago, a Select Committee "considered" the feasibility of a new street from the Strand to Holborn; it proposed to take down the houses on the north side of the former thoroughfare, and between the two churches. Many another Select Committee has also "considered" the desirability of making a broad and direct opening into Lincoln's-inn-fields both from the Strand and from Holborn. But, after all these years, nothing, absolutely nothing, concerning the approaches to the City by Temple Bar, or to Westminster by Whitehall and Parliament-street, has been done or even decided to be done. The very thought of improvement lies enveloped in the fog of confused legislation.

"It is simply disgraceful to allow the New Law Courts to rise," said the monarchs, "and to lose the chance of a direct opening from the Strand into Lincoln's-inn-fields and Holborn. Are you prepared, mortal, to urge the immediate reconsideration of that matter and immediate action thereon?"

Neither of the kings could hear our feeble but unqualified voice of assent from their distant eminence.

"We, George Rex, who made the Regent's Street, command you not to rest one week until some responsible person be appointed,—some human being, not a Board,—to take upon himself the chief and sole initiation of Metropolis Improvements. Strike at the root of the evil that holds London in its meshes, spare none of those who promote the spread of that evil."

"Be constitutional, as I was," cried the Stuart, "but hit hard."

"Be absolute in wielding constitutional powers," cried the Guelph, slowly disappearing.

"Do it constitutionally," shouted Charles II., almost from the other side of Chancery-lane, "but peg away."

* * * * *

"Are their Majesties gone?" we said, as a servant touched us on the shoulder; "have you shown them out?"

"Please, sir, the cart's at the door with the Parliamentary Papers."

"Oh! for the new TALE OF ST. STEPHEN'S. Hire some carpenters, and try to get the papers all in before midnight,—but have their Majesties really departed?"

"You've been asleep, sir, and no one has called."

"Stuff, we were never so wide-awake as at the present moment."

In evidence of the fact, a letter we had only just received lay on the table. It was a note from the Mulligan of Bally-Mulligan, intimating his intention to move:—

"*That* a SELECT COMMITTEE be ordered to "report upon the Mental Condition of those "members of both Houses of Parliament who, "since the passing of an Act, 35 Geo. III., c. "126, have SURVIVED official inquiries into the best "mode of improving the Approaches to London "and Westminster (having regard to the concen- "tration of PUBLIC OFFICES at Whitehall, and of "the LAW COURTS at Temple Bar), with a view "to Scientific Method in its design, and of "Rigorous Economy in its execution.

"*Further, that* the Committee HAVE POWER to "send for Papers.

"*Further, that* the Committee HAVE POWER to "report their Observations."

This, it appears, will be seconded by the member for Donnybrook, and supported by the whole Irish Brigade. The Mulligan of Bally-mulligan therefore asks for facts. What a pity that their Majesties should have left! Nevertheless, though the monarchs cared not to hear our willing answer to their gracious exhortations, they may be certain that during this session we will "HIT HARD" at men as well as things; and for many sessions hereafter we will "PEG AWAY" at the chaos of Unrule that afflicts London.

Suggested Hotel de Ville for London.—In view of the possibility that the municipal government of London will be reorganised, a correspondent of the *Daily News* suggests that the large area formerly occupied by the City Gasworks at the eastern end of the Victoria Embankment would form an appropriate site for a series of grand central municipal offices for the whole of London. Guildhall, even if considerably enlarged, would, he affirms, be too restricted in area and inaccessible as to locality, to serve as the head-quarters of a municipality governing the whole of London.

OLYMPIA.

MR. SIDNEY COLVIN, M.A., Slade Professor of Fine Art at Cambridge, delivered a lecture on Thursday evening, the 24th ult., at the London Institution, Finsbury-circus, on "Olympia and Ancient Greek Athletics," to a crowded audience.

Professor Colvin commenced by saying that the Olympic games, so famous among the Greeks, were held at the beginning of every fifth year on the banks of the Alpheus, near Olympia, in the Peloponnesus, now the Morea. The river Alpheus was very much subject to violent floods and storms, which were frequent, owing to the adjacent mountains. Within a sacred enclosure on the banks was the place where the games took place, it being filled with temples and statues and other glorious works of Greek art, being the greatest museum of arts which had ever existed. The excavations which were now going on in that city was not a matter of one or two seasons, but it would probably be fully four or five years before they were finally completed. They were carried out in a most systematic way by trained archæologists, at the cost of the German Government, the enterprise upon which they were engaged being of an extensive character, the results of their labours being the greatest in any age. They had heard a great deal of the discoveries at Troy and Mycenæ, at sites which were identified with the name of Homer, and what relation these discoveries of Dr. Schliemann actually bore to any Greek civilisation which the poems of Homer described was a thing at which they would have to work a long while yet before they could be sure of the truth; but, as regarded the excavations at Olympia, they were of more importance to the student of Greek antiquity than other discoveries, because Olympia was the great centre of the common and united life of the Greeks; it was the great museum of their art,—not in obscure days of the origin of Greek civilisation, but in its full ripeness and glory. They heard from various sources of information what one expected to find there in the shape of marble statues, the handywork of men whose names were handed down to them. Many of the memorials actually to be found belonged to the greatest times of Greek art, and there was a difference between the perfect sculptures they could identify as being the work of the Greeks and the doubtful, obscure, semi-barbarous discoveries found in the legendary statues of Troy and Mycenæ. Without doing injustice to the praiseworthy discoveries of Dr. Schliemann, they ought, nevertheless, to bear in mind the sovereign importance and the really much greater interest of the work which was now being done in the valley of Olympia.

With regard to Olympia itself, they knew that all the fame and glory of the country rested upon the love of the Greeks for physical sport, physical powers, and physical beauty. It had often been said that the modern idea of Englishmen was similar to that of the ancient Greeks, viz., a love of physical sports, and an ignorance of all languages except his own. If that were true, the Greeks had some excuse, because their language was the one civilised language of their time. In their athletic games, in cases of fraud where a competitor would not do his best and was found out, the penalty for him was to help to make the place beautiful by giving a bronze statue to the presiding god of the place,—Jupiter,—and when the traveller Pausanias visited Olympia he found a vast number of these bronze statues, which had been dedicated to Jupiter. As to the historical origin of the games, nothing in Greek life, collective or private, ever took place independently of Greek religion, every act being patronised and protected by some deity or other amongst the Greek gods. At first the meetings were purely of a provincial character, there being only a few races, but after a time they became more important, and gained a great reputation, and the Greeks of various races were brought together in a spirit of unity and friendship, and gradually the festival became pan-Hellenic. At first it consisted only of foot races between competitors in the neighbourhood, but after a time the names of the victors became solemnly recorded in history, and Greek chronology became to be dated. The youths were exercised in five kinds of combats, the conquerors being highly honoured for their skill in jumping, racing, throwing the javelin, wrestling, and boxing. Although it was forbidden for women to be present at the games, they were allowed to send their chariots and drivers to compete in the four-horse chariot races. From a single race meeting it became so popular that it was protracted to five days. July was the month selected, in which the whole of the Greek-speaking race were bound to unite together in the valley of Olympia, the festival being celebrated for 1,100 years. The contests were not only confined to athletic sports, but there were musical and poetical competitions. Historians like Herodotus used to publicly read their writings; while Socrates,

"The old man eloquent,"

also publicly appeared before the Greeks. But the whole glory of the Olympian celebration for the universal Greek mind was for physical prowess and physical beauty. Originally the prizes were in money, because it had been thought desirable to attract competitors, but that was soon found to be unnecessary, and then was substituted the prize of a crown made of a kind of wild olive, which was noble and heroic. The victor first of all had his name proclaimed by heralds, then he and his country were congratulated upon the honour that was gained, after which the games were over, and the great crowd went home. In many instances the victors were retained for ever after in the public service, and hymns were written in their honour by the greatest poets. For instance, the greater part of the poems of Pindar referred to the victors of the Olympic games.

The victors, too, were honoured in an imperishable form of art, for the sacred enclosure of the Alpheus contained a crowd of statues which were dedicated to Olympia, being generally of bronze, and set up in honour of the victors. The site where these games took place was a most favourable one for the preservation of ancient ruins, it being not built upon hard rock or on a volcanic site, but in the midst of an alluvial plain; therefore, the soil was such that the sculpture would be preserved, and it was hoped that the German explorers now at work would be highly successful in their task. Many sculptures had already been found in a good state of preservation.

Professor Colvin, by means of the oxy-hydrogen light, then showed a number of these sculptures, which he said were the result of the first year's discoveries.

PROPOSED THOROUGHFARE FROM HOLBORN TO THE STRAND.

MR. W. M. TEULON has prepared a plan proposing certain improvements in the Strand, combined with that of a new street thence into Holborn. The scheme has been approved by the Strand District Board of Works, and they have forwarded it to the Metropolitan Board of Works, recommending that it shall be carried out: that Board have had it under consideration, and have referred it to their Committee of Works. The features in the Strand improvement consist in the demolition of the block of houses between the churches of St. Clement Danes and St. Mary-le-Strand, thereby bringing out those two structures into full view, and widening the Strand at that part to the present north side of Holywell-street. As a resting place in this wide roadway he proposes to have an avenue of plane trees somewhat similar to the Unter den Linden at Berlin, with a garden at the east end; the purpose of this would be to afford a shady rest with seats, and to divide the traffic, besides contributing to the ornament and cheerfulness of an important thoroughfare.

Also the widening of Wych-street is intended to relieve the Strand of such traffic as may be flowing from the northern parts of London to the Law Courts or the City; to effect which it will be necessary to remove the two theatres (the "Globe" and the "Opera Comique"), and appropriate their sites to building purposes.

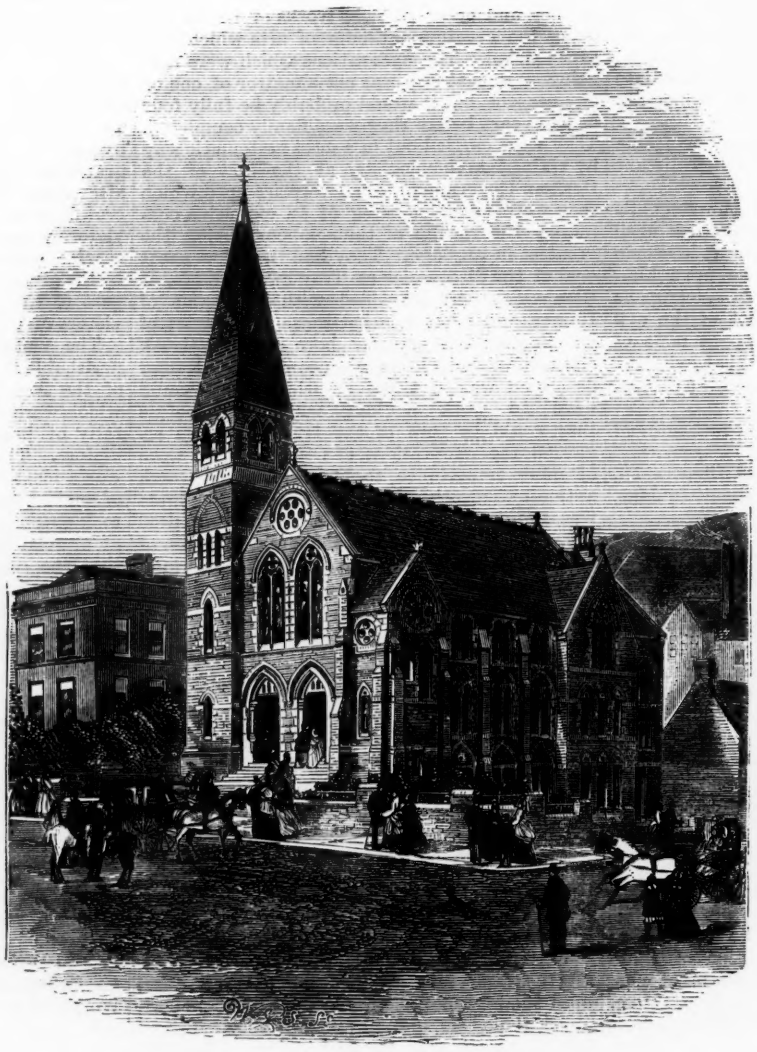
The proposed new street is laid out with a view to utilising existing thoroughfares to the fullest extent, by simply connecting them together,—thus, by cutting a way through Clare-market, and widening Houghton-street and Newcastle-street, a commodious street would be formed from the Strand into Lincoln's-inn-fields; and by the removal of Little Turnstile and the adjacent houses the same would be effected between Lincoln's-inn-fields and Holborn. Mr. Teulon, rightly or wrongly, has widened streets only on one side, so as not to interfere with the trade thereof more than is necessary. In connexion with the Strand we observe that

the roadway north of St. Mary-le-Strand Church is also widened, thus continuing the double traffic line some little distance westward. It is obvious that when the Law Courts are opened the present streets will be utterly insufficient for the greatly increased traffic that will surely result; and that it would be desirable to prepare for what will inevitably come to pass before the time arrives when it will be absolutely needed.

Mr. Thomas Peard, of Wych-street, who has for some time given his attention to the subject, has also sent us a plan with the same objects in view. It includes several suggestions that may well be considered by the authorities before coming to a final decision, but we are bound to say that the want of *directness* in the main thoroughfare, as proposed, is decidedly against the acceptance of it as a whole.

BINGLEY BAPTIST CHAPEL.

THE building shown by the accompanying engraving was opened last year. It stands on a corner site in Park-road, and consists of a nave, 72 ft. long (measured on the gallery floor) and 37 ft. wide; transepts, baptistery, &c., with galleries all round; porch, giving access to both floors of the church, and to the basement and vestries (with lavatory, &c.) on the ground floor. The basement is occupied by a large school-room, 36 ft. by 37 ft.; two class-rooms, each 15 ft. 6 in. by 20 ft. (with sliding partitions between each of them and the school-room), and a smaller class-room, besides heating, lumber and store-rooms, with staircases to the ground floor at either end. The school floor is nearly at a level with the side street, which is rendered practicable by the rapid fall of the ground. The chapel is roofed with open timbers, boarded; and the seats are open benches. The style of the building, which was designed by Mr. F. Bartram Payton, of Bradford, architect, is an early and plain kind of Gothic. The tower, which contains a staircase leading to the galleries, rises to a height of nearly 100 ft. to the summit of the finial; and the site is enclosed by a low wall, with ornamental palisades and gates. The total cost, exclusive of land, was 4,400*l.*; and the number of sittings, at 20 in. each, is about 650. The masons' work was done by Messrs. Fould, Brothers; the joiners' work by Mr. Whitley; the slating by Mr. T. Thornton; the plastering by Messrs. Greenwood & Spurr; and the painting by Mr. Dawson, all of Bingley. Mr. Schofield, and Messrs. Taylor & Parsons (all of Bradford), respectively did the plumbers' and iron work; the latter also supplied the heating apparatus, which is for hot water. The gasfittings were supplied by Messrs. Freeman & Collier, of Manchester.



BAPTIST CHAPEL, BINGLEY.—MR. F. BARTRAM PAYTON, ARCHITECT.

Presentation from Builders. — Messrs. Mappin & Webb have manufactured a silver centrepiece, with plateau and base, for presentation to Mr. William Pink, from the Master Builders' Association of Portsmouth. It bears, with arms and monogram, the following inscription:—

"Presented to William Pink, Esq., by the members of the Master Builders' Association, in recognition of his public services as Mayor of the Borough of Portsmouth during two successive years, and of being instrumental in establishing a Benevolent Fund in connexion with the Association, and also as a token of esteem."

KNIGHTSBRIDGE BARRACKS.

WE give in our present issue a general plan and two elevations (one towards the Park, in two parts, and one towards the Knightsbridge-road) of the new Cavalry Barracks now erecting on the former site, from the designs of Mr. Thomas Henry Wyatt. A long controversy was carried on as to the desirableness of re-erecting these barracks in Hyde Park, but, ultimately, for asserted strategic reasons, the old site was determined upon.

The buildings which have recently been taken down were constructed to accommodate six troops. On a plan approved by his Majesty George III. is written in pencil, "Copy sent to the King, March 28, 1792." It is signed by James Johnson, architect, and in an engraved survey of London of 1794, the main block of buildings is shown, being much as it recently stood. Several additions were subsequently made, and there is a plan in existence, showing the officers' quarters, dated 1795. The long row of officers' stables was built about 1805, and various minor additions were made as late as 1840. In 1717 no buildings existed in Hyde Park west of Park-place, and where the barracks recently stood there was a pool.

In 1855, in a public competition for barracks, the first prize for a "Cavalry Barrack" was awarded to Mr. T. H. Wyatt and his brother, the late Sir Digby Wyatt. In spite of repeated promises from various Secretaries of State for War that a cavalry barrack should be entrusted to these gentlemen, it was not till 1875 that Mr. Hardy, recognising the strength of their claim for employment, decided on placing this work in the hands of Messrs. Wyatt. The unfortunate illness and subsequent death of Sir Digby Wyatt prevented his taking any share in this work, so the charge of it has fallen on Mr. T. H. Wyatt.

The site, which has always had the disadvantage of being unduly narrow, was rendered still more difficult to deal with by the sale to the Metropolitan Board of Works of a strip of land, comprising about 500 square yards, next the Knightsbridge-road (shown on the plan), so as to give that road a uniform width of about 60 ft., and this unfortunately occurs where the riding-school is now placed, and where width was much needed.

The front of the barrack, next Knightsbridge-road, has been thrown forward to the line of the street, thus enlarging the internal parade-ground, and by keeping vacant spaces open at the east and west end of the barracks improved ventilation will be obtained.

The accommodation in the new barracks will be:—For 23 officers; for 352 non-commissioned officers and men (single); for 40 married men; for 386 troop horses; and for 76 officers' chargers, and 15 horses in the infirmary stables.

It was originally proposed to retain the block of officers' quarters, merely adding a new mess establishment as a wing, and to have retained the old riding-school. Mr. Hardy was, however, induced to sanction the erection of a new and more uniform block for the officers' quarters, and a new riding-school, the old one having been most inconveniently placed, and being less than the average size. It will now be placed between the barracks and the officers' quarters, so that the troopers will be able to ride into it from their parade, and the officers on the opposite side from their stables and quarters.

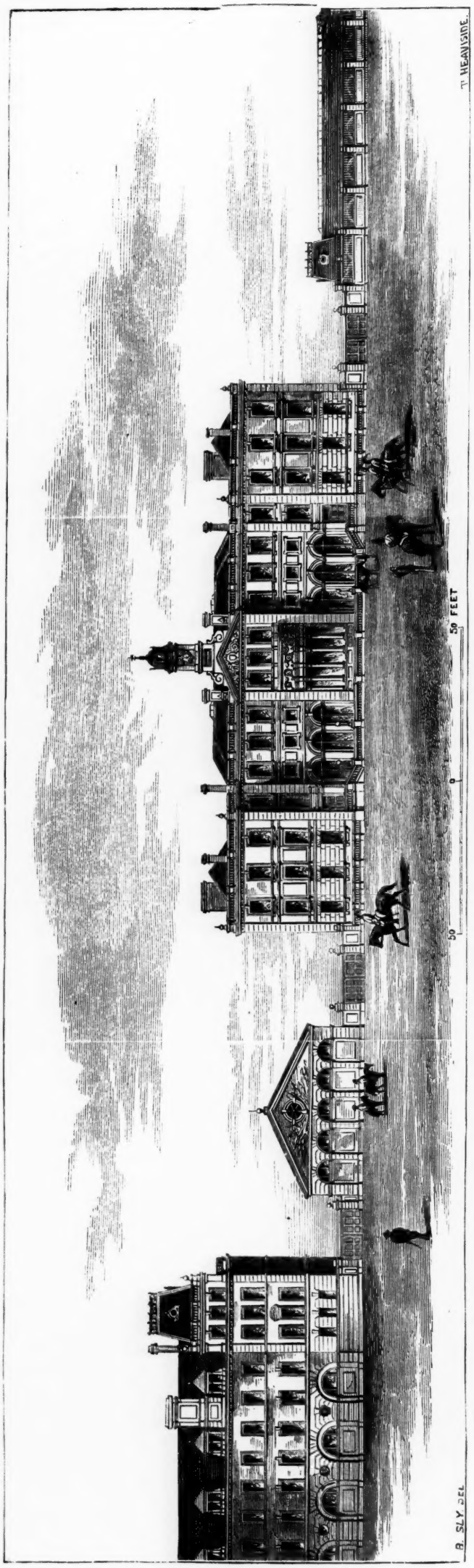
The different arrangement necessary for the accommodation of unmarried troopers and married men has led to a different treatment of the elevations next the park and next the Knightsbridge-road. In the former case very large dormitories, with fireplaces only at the ends, required a somewhat monotonous treatment; whilst in the latter case each married couple, having two rooms, and each with fire-places, led to a more varied and broken treatment; in the latter case eighty flues are called for, in the former case there are only twelve necessary. Between the upper part of the pilasters which form the chimney-stacks, a balustrade runs the whole length, and the upright line of the attic roof, and the dormer windows in it are set back 6 ft. so as to form an external gallery for the children of the regiment to play in.

The open terrace and pavilions on the park side are for men to smoke in.

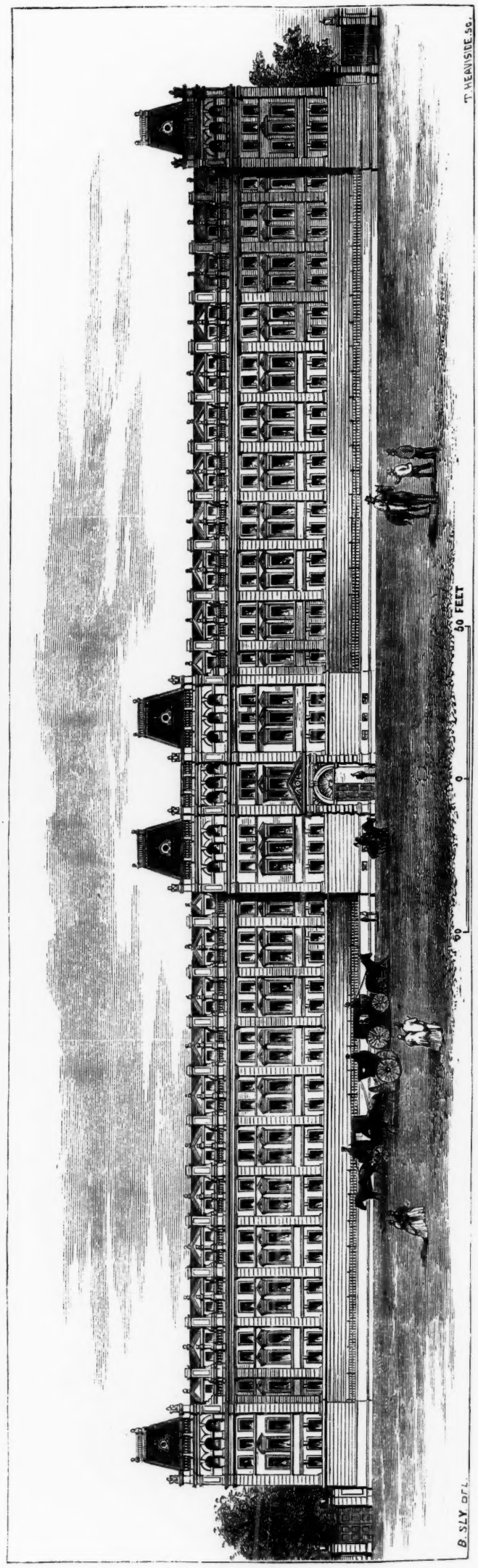
The horses are, of course, on the ground-floor, and on the level of the parade; but inasmuch as there is a difference of 11 ft. between the archway on the park side, and the pavement in the Knightsbridge-road, much greater height is given to the building on its south front, and opportunity is afforded for having a range of workshops and stores in a basement story under the whole of this block.

The materials used in the construction of this barrack are Portland stone and red brick; and the floors are in some instances built fireproof with wrought-iron and concrete. Large water-tanks are provided in the several towers.

The contract has been taken by Mr. Shaw, of the late firm of Jackson & Shaw, and the time originally fixed for its completion was two years and a half. How that question may be affected by the masons' strike remains to be seen.

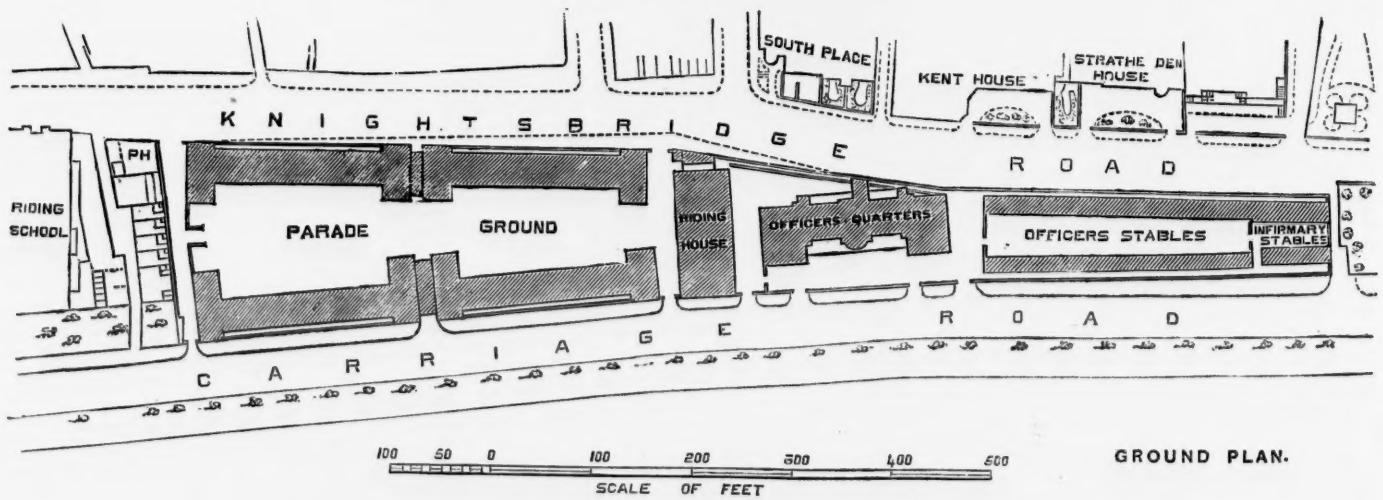


ELEVATION NEXT THE PARK, SHOWING OFFICERS' QUARTERS.



ELEVATION NEXT THE KNIGHTSBRIDGE ROAD.

ELEVATION NEXT THE PARK.



GROUND PLAN.

KNIGHTSBRIDGE BARRACKS.—Mr. Thomas Henry Wyatt, Architect.

"RESTORATION" *v.* "CONSERVATION."

ARCHITECTURAL ASSOCIATION.

AT the ordinary fornightly meeting of this Association on the 25th January, Mr. Bowes A. Paice, president, in the chair, Messrs. A. H. Belcher and F. Oliphant were elected members.

A vote of thanks was passed to Mr. Waterhouse for his kindness in allowing the members of the Association to visit the new Natural History Museum at South Kensington (as reported in our last), the President remarking that Mr. Waterhouse was one of the few senior members of the profession who still retained his connexion with the Association as a member, and the Association could not but consider it a great honour that they had now an Associate of the Royal Academy amongst them.

It was announced that the next visit would be made this (Saturday) afternoon to the Carpenters' Hall, London Wall. (For further particulars see advertisement.)

Two papers were then read on the subject of "Restoration" *v.* "Conservation."

Mr. William White, F.S.A., read the first paper, in the course of which he said that, taking for granted that without grave reasons of expediency, or almost of necessity, we were not justified in altering or defacing an old architectural feature which might become, if handed down intact, the channel of association with the past, and a link in the history of art,—a landmark of original design or of later development,—the question to be discussed was one not so much of controversy between "conservation" and "restoration," as of endeavouring to draw some line of demarcation, if that were possible, between what relics of the past ought to be, and what ought not to be, "conserved," in respect of taste, of date, of construction, of character, of association, on the one hand; and in respect of decay, expediency, necessity, on the other; the end in view being the attainment to some general agreement of principle and of practice as to the means most likely to tend to true and proper conservation. In spite of the loss,—the most sad, most grievous loss,—in past years of much that ought to have been retained, yet what had been left had been conserved for very many generations yet to come for the formation and growth of revived art, for the deepening of association with the past,—national, domestic, and religious,—instead of its being utterly destroyed, as it very shortly would have been if only such patching and protecting as was now advocated in some quarters had been followed out. Much as some might sneer at the revival of historical and antiquarian sentiment, of ritual propriety, and of ecclesiastical continuity,—of religious earnestness, of piety, of poetry, of romance,—as being responsible even indirectly for the destructive element in church restoration, he could not but think that in England that very revival had been chiefly instrumental in a restoration as conservative even as it had been, instead of religious activity culminating, as it did for a long time in Ireland, in the production of the most bald and uninteresting buildings, to the utter disregard of the ancient churches. But when, as Dr. Colvin called him, "the exponent of the passion of the architecture of the Middle Ages," in the simple Protestantism of his own views, could make no allowance for anything beyond the most bare and abstract, if lucid, æstheticism, what could be expected but that his teaching should be ignored, at any rate in so far as he himself had ignored its just influence upon the revived ecclesiastical traditions and popular religion of the nation? And should we be taunted with the expenditure of millions in church restoration? Verily, the learned Professor must have but little knowledge of the claims of external religion, little sense of the needs of an awakening church, little perception of the value really set upon the heritage of our fathers (though the means of showing it might have been for a long time somewhat mistaken), if he could bring himself to believe that the money was expended for the mere gratification of a whim or in submission to a fashion, or even to serve the baser interests of those engaged in the work. And, although many of his strictures were unhappily but too true as to wholesale destruction of the marks of age and antiquity, yet it was possible to make too much of the prevalent idea that because the softening tones of age and decay enhanced the beauty of good old forms, therefore age and decay must be good in themselves, and not merely as accidental accessories. Art was to be dependent upon them, rather than they upon art. Some distinction likewise ought to be drawn between merely old work and artwork, between surfaces or mouldings cut by line and by rule, and carvings or sculpture cut only by the dexterous hand, aided and inspired by a faculty which could not be subjected to laws of mechanical operation. If architects and others were to be condemned as destructive restorationists equally whether they would replace or repair a marble clustered column, falling to pieces through neglect or natural decay, or whether they would tenderly clean off with a penknife, or other delicate instrument, the incrustations of lime or whiting and size which had overlaid the delicate touch of the carver of its foliated or sculptured capital, whilst they shrank from touching even the most damaged part of real sculpture or carving, let their well-meaning judges beware lest they exposed themselves to the charge of being, if not destructive conservationists, at least of being sentimental and misguided enthusiasts. To take another crucial instance of a very pertinent and practical nature. Would it have been better to have left the interior of Exeter Cathedral in its old neglected state, than to remove the dirty yellow wash laid forty years ago upon a similar coating thirty years older, and to bring out the rich tints of the original stonework? The real question was, however, not how far the claims of strict conservation might be defended or not, but how far they were practicable, and not merely theoretical, in the form in which they had lately been put forward. Church restorers might recognise and admit to the full the duty of preserving untouched every scrap, every lineament of the past, for the sake of posterity, for the sake of art, for the sake of historical record or sentimental association, whilst they failed to see how those ends were really to be attained by the use of the means suggested, especially when carried to the extent to which it was proposed to apply them. The very objects in view were, by an exaggerated idea of conservation, in danger of being defeated by the means taken for effecting them. A lamentable amount of destruction had undeniably taken place under the guise of restoration, but the proposed conservation would be often and quite as lamentably destructive, not only of the buildings, but also of the purposes which the conservation itself was designed to serve. It was laid down as a general principle that if a building could not be conserved without restoration, a new one should be built by its side, and the old one should be left intact on its old site. But, even allowing this, surely some distinction ought to be drawn between the rural village church on the brink of destruction,—its roof perished, the mere patching together, perhaps, of various timbers, its walls disintegrated and ready to fall,—and the noble remains of substantial structures which, in spite of their roofless state and their centuries of neglect, had so wonderfully resisted the encroachments of decay. Granting that the old building would still be left for the purpose of art and antiquarian study, for old associations and for future poetic inspiration, the new one was to be *used;* and it was quite certain that if old buildings were thus to become mere museums of antiquarianism, or of curiosity, all affection for them as the sacred repositories of art would very quickly die away. Taste, instead of being educated up to their appreciation, would be lowered to the the inferior forms and associations with which it would then, in the new buildings, be surrounded, seeing (and admitting the assumption) that anything now put up must be utterly and immeasurably inferior to the old. Even though an appreciation of the old forms should to some extent survive, those forms would soon come to be regarded rather as picturesque remains than as living monuments of art,—for people's minds and tastes were moulded by contact with what they saw and lived upon in their daily domestic and religious life. It was very greatly through familiarity with buildings restored in a manner fitted to their proper use that the people generally had at all become educated to see in ancient work anything beyond the commonplace of neglect and decay. No, said Mr. White; let us have some inevitable mutilation rather than countenance such destruction as would follow from mere conservation, seeing that many old buildings would inevitably be swept away, sooner or later, when they had ceased to serve any useful purpose. The forms, outlines, proportions, and numberless features, might yet remain to us, even in the case of an ill-built and dilapidated building already tottering to its fall, and which, unless "restored," would certainly, ere long, be removed. Let the restoration be done with the tenderest hand, and with the most reverent heart, by carefully retaining every vestige that could safely be kept. In the restoration of old decayed or mutilated stone or wood work, let it be insisted on that the material should be pieced or repaired rather than renewed, and that some old crumbling scrap,—say, of an ancient door or window,—should be worked-in in the new work instead of completely obliterating all vestiges of the identity of the old building.

Mr. R. E. Pownall followed with a paper on the same subject, in which, speaking as an architect and as a lover and student of old buildings, he expressed great sympathy with the protests made of late years against the mania for restoration. He quoted Sir Gilbert Scott and others for the purpose of showing that, even with the very best intentions and the utmost care and anxiety on behalf of church "restorers," irrevocable damage had been done, and was likely to be done, and contended that all students of history and lovers of architecture ought to unite in a protest against denuding old buildings of all features which, because they were not of a particular period, might be deemed, by restorers, excrescences or anachronisms. Architects and clergymen had much to answer for in this connexion, and the new society for the preservation of ancient buildings had not been established a day too soon.

The discussion of the papers was adjourned.

AN EDINBURGH PROFESSOR ON DOMESTIC SANITATION.

ON Tuesday, the 22nd ult., the Professor of Civil Engineering in the University of Edinburgh, Mr. Fleeming Jenkin, delivered a lecture to the members of the Philosophical Institution of that city on Domestic Sanitation.

The Professor stated that in order to ascertain whether the sanitary arrangements of a house were satisfactory, it was necessary to have proper professional assistance, and he hoped to be able to show that the conditions of a healthy dwelling might be secured, at no great cost, in most of the houses actually occupied. In Edinburgh, for the most part, the subsoil drainage and construction of the walls and floors of houses were good, but the internal arrangements for water-supply and sanitary appliances were referrable to a time when sanitary engineering was very imperfectly understood. The germ theory explained how families who lived in the midst of great filth might not be affected thereby in their health, while others in large and clean mansions were struck down by fever and diphtheria. The filth which was compatible with health was isolated filth; and until the germs of some disease were introduced, this filth was merely injurious, not poisonous. It was when confined to sewers, &c., where the germs were most prolific and the system of drainage too frequently acted as so many suckers, by which the germs were drawn into the house. It was not necessary to produce that effect if nothing injurious went down the pipes: it was what came up them, owing to their connexion with the other parts of the drainage, which produced the evil; for although nothing more serious than scented soap went down from a bedroom, the germs of typhoid fever might ascend to it.

The first sanitary principle to be attended to in a town-house was to cut off entirely the gas evolved in the common sewer from the house. The next was to isolate all tainted matter sent out of the house from the air and water let into it, and the more rapidly the tainted matter left the house the better.

Professor Jenkin then, by means of diagrams, explained how this desirable end could be effected. He advocated double-traps with an opening to the outer air between them, and showed experimentally the action of this device. He warned his hearers against the numerous devices palmed upon the public, which had been brought under his notice. He then stated the causes which often led to the stoppage of sewage in its transit to the sewer. Periodical inspection was necessary to detect these stoppages, and with such a trap as he had described this inspection could be made in a few minutes.

The lecturer then, by means of a diagram, explained how the system of pipes in a house should be arranged, and stated the chief dangers to be:—(1) Complete stoppage by

kitchen grease or other rubbish, whereby the house was not drained at all; but its filth, through leaky drains or otherwise, deposited in the basement; (2) absence of proper traps and ventilation whereby the sewer-gas escaped into the rooms; (3) old systems imperfectly cut off; (4) cisterns placed where they were liable to be contaminated. No great expense, no patented arrangements, were required to remedy these evils, but the application of principles to particular cases and skilled advice and periodical inspection. Official inspection he could not advocate, and the officials laid down general principles so severe that to put them into practice involved the destruction of existing arrangements; and, if asked to frame positive laws to be obeyed under penalty, the conditions were so easy that no safety was given. The only objection to voluntary inspection lay in its expense, and in the difficulty of selecting an adviser. The idea had occurred to the Professor that these difficulties might be overcome by means of association. An association had accordingly been formed in which the assistance of Dr. Littlejohn and Councillor Gowans had been most valuable.

The outline of the proposed association is as follows:—

By clubbing together, the body will do at small cost what would cost each member a considerable sum but for the application of the co-operative principle; and the recommendations made will be subject to the control not only of a professional man of high standing, but also to that of a body of men of many professions who will form the council of management. It may really be hoped that the problem of how to put and keep our houses in good sanitary condition is in a fair way of solution.

Any one in Edinburgh may become a member of the new association by payment of an annual guinea. The association will retain the exclusive services of one or more young but well-trained engineers, who will act under the general superintendence of a consulting engineer of high standing. The premises of each member will, in the first instance, be very thoroughly inspected, and a report furnished, giving, if need be, specific recommendations as to improvements in drainage, ventilation, and water supply, with estimates. Any alterations in his sanitary fittings which the member makes, with the approval of the society's officers, will be supervised by them. The first inspection of each house will, of course, be of special importance; but although sanitary appliances may be once set in order there is no security that they will remain so. There are numberless ways in which drains may go wrong, in their legitimate as well as illegitimate use, and to guarantee continued efficiency periodic examinations must be made. The engineer of the association will inspect every member's house once a year, and give a report upon its state. Besides these privileges, which are possessed in virtue of the annual subscription, members may obtain the services of the inspectors at other times, or with regard to other buildings, on payment of small supplementary fees; so that a member about to build a house may receive advice on the sanitary merits of his architect's plans, or one about to buy or hire a house may send the engineer of the association to report upon it. All the inspections will be carried out on general lines laid down by the consulting engineer, whose professional position and experience will in this way give to the work of the younger men the authoritative character it would otherwise want, and to whose maturer judgment cases of special difficulty will be referred. The association is not purely selfish in its aim, for it will afford an opening for the philanthropy of its members, by enabling them, on payment of small fees, to obtain reports on the dwellings of the poor. The fees charged will be regulated in proportion to the rental of the buildings examined in such a way as to prevent the abuse of this rule. The association will not conflict with the public authorities, but rather help them to detect infringements of their regulations. None of its officers may be patentees of sanitary appliances, or have any interest whatever in recommending outlay.

Glasgow.—On the 23rd ult. the Glasgow operative masons received intimation from their employers of a proposed reduction of 1d. per hour (from 9d. to 8d.) on their present rate of wages, to take effect from the 18th of March next.

THE ART OF MARBLING.

At the Society of Arts on January 23rd, Mr. C. W. Woolnough read a paper on the art of marbling as applied to paper. In the course of it he said,—Fifty years ago, it was almost as difficult to get a sight of the inside of a marbling establishment as it would be to get into the presence of Royalty; every crack and aperture, nay even the very keyholes, were stopped up or obscured, to prevent any glimpse being obtained as to the method by which it was accomplished; and, as comparatively few were in possession of its secrets, it was a very remunerative craft, and good profits were realised.

When I was about thirteen years of age, I accompanied an individual who was going to fetch some books which had been sent out to be marbled; when we arrived they were not all finished, and your humble servant was admitted into the sanctum to wait for the remainder. I was so stricken with wonder and admiration at the sight, that I resolved in my own mind not to rest till I had found out how to do it. I will not now take up time by telling you of all the failures and the disappointments I met with; but at length, by unremitting toil and persevering efforts, I was in the end rewarded with success, and though for a long time the results were very imperfect, yet I could perceive that I had got hold of the root of the matter, and, after much practice, I, of course, approached nearer a perfect result; and as I was indebted to no one for the knowledge I had obtained, in the year 1853 I published a small work on the subject, which gave great offence to the fraternity, on account of its truthfulness, and the way in which the various kinds of marbling were set forth, and the manner of their accomplishment explained. You see here now before me a shallow vessel or trough, about 2½ in. or 3 in. in depth; it contains a thin mucilage. Now, there are several kinds of mucilage, viz., first, and most important, gum tragacanth, called by some gum dragon; secondly, linseed or flax seed; thirdly, Irish or Carrageen moss; fourthly, a seed, called among the initiated, flea seed, the name being given on account of its great resemblance to that well-known but troublesome insect, but really the seed of a kind of plantago, cultivated, I believe, in the south of France, and much superior to linseed, on the ground that it retains its properties a much longer time; besides one table-spoonful will produce as much mucilage as half-a-pint of the linseed. The mucilage used this evening is a solution of gum tragacanth. It takes two or three days to dissolve, and requires to be frequently stirred or beaten up during that time, in order to break the lumps, and to combine the gum with the water, after which it must be strained through a fine hair or muslin sieve before using. I shall now proceed to show you by what means the colour is made to float and expand upon the surface of this liquid, but first will prove that, without some other agency than water in the mixing of the colours, they will neither float nor spread, and there is but one thing at present known that will effect this. It is a very simple though subtle and powerful fluid,—no expensive or elaborately prepared article; it is purely a production of nature, being nothing more nor less than the gall of an animal. Ox-gall is the sort generally used; it is the easiest to be obtained, and is within the reach of all who may wish to try the experiment. I will not say that the gall of a horse may not be as effective as that of an ox, having never tried it; but I have tried the gall of sheep, and proved it much weaker, so that ox-galls diluted with water would be quite as good as that; but there is sometimes a great difference in the galls taken from different animals, some being far more powerful in their operation than others. The gall of one animal may be thick and ropy, which is objectionable, while that from another may be beautifully fluid, which is more pleasant to use. When fresh, it has no unpleasant odour, but when stale it is anything but agreeable, though none the worse for the required purpose; indeed, I consider it preferable.

I will now proceed to show you the action of the gall. I first draw this thin flat piece of wood, called a skimmer, over the surface of the solution trough. You ask me why I do this? I reply, because, while I have been reading or speaking, there has been forming, on the top of the liquid a film or thin skin, which, though imperceptible to the eye, is quite sufficient to f.ustrate the proper result. I now take a colour mixed only with water and allow a few drops to fall; it neither floats nor spreads, but falls to the bottom of the trough. I now pour a little gall into the same colour and again sprinkle some on the surface, this time, however, it floats and spreads all over the surface of the mucilage. I just lay on that a piece of white paper, and pouring into a glass a little water, I add a few drops of gall, and with a brush sprinkle it over the portion of the surface of colour not covered by the paper, and you will see that it has divided the colour into veins, thereby showing the effect produced by the gall when it is mixed with the colours; and in order to enable you to see the effect of this more vividly, I will lay on another piece of paper by the side of the first, and lifting the two out simultaneously, the operation or effect of the gall is clearly made manifest. This is the foundation of the whole process; this is the root from which all the branches spring, and although there may be other ingredients required to produce various effects, still these two simple productions of nature,—the gum and the gall,—constitute the life and soul of this (as the late Dr. Normandy designated it) "pretty mysterious art." . . . .

Now, after laying on all the colours, it rests entirely with the operator what shall be produced after all, for out of these few colours as they now lie floating on the surface, a diversity of results can be obtained quite distinct the one from the other, and with a piece of pointed stick, a comb, or a piece of wire, you may indulge your fancy to almost any extent; and then, by diversifying the colours or the arrangement of the colours, an almost infinite variety of combinations and changes may be produced. Having disposed of the first question, viz., what is it that causes the colour to float and spread out upon the surface of the solution? we come to the second. What is it that keeps the colours from commingling, when they fall one upon another? or, in other words, what is it that keeps each colour clear and distinct, though several may even be thrown on at the same time, and though they may be even twisted round,—nay, almost stirred with a pointed stick, every colour retaining its perfect individuality, though in so very minute a degree as to require a magnifying glass to reveal it? My humble opinion is this: the moment the colour touches the surface of the mucilage, it displaces a portion of mucilage itself, which forms a bind of bulwark or barrier around it, and thus prevents it meeting with the colours which had been previously put on; so that, were you to put on a yellow and immediately follow with a blue, there would be no signs of a green being produced, although, if you were to mix the two colours together before you put them on to the mucilage you would have a decided green at once.

DISTRICT SURVEYORS AND THEIR DUTIES.

METROPOLITAN BOARD OF WORKS.

At the meeting of the Metropolitan Board of Works on the 25th ult., a letter was read from the foreman of the coroner's jury empannelled to inquire into the cause of the death of Patrick O'Connell, who was killed by the fall of a house at Hackney, as reported in our last (p. 26, *ante*). The builder, Mr. Hackett, had, in accordance with the verdict of the jury, been committed on the coroner's warrant to take his trial for "manslaughter," and the foreman of the jury now wrote to ask the Board to undertake the prosecution, seeing that it was a matter affecting the public safety, and that the coroner's officer, upon whom the prosecution would practically devolve, unless it were taken up by the Board, was without the legal training and the means to enable him properly to conduct the prosecution.

Mr. Runtz, who represents Hackney at the Board, moved that the letter be referred to the works and general purposes committee for consideration and action, if deemed necessary. *Primâ facie*, it appeared to him to be a case in which the Board ought to take upon itself the *rôle* of public prosecutor. He believed that one of the so-called 9-in. walls in question was built entirely of bats,—there was not a whole brick in it,—consequently, there was no bond; it was rather two 4½-in. walls side by side than one 9-in. wall, while the mortar was such in name only.

Mr. Selway seconded the motion, and incidentally remarked that while perhaps some of the district surveyors were not always sufficiently stringent, in the present case the builder had been warned by the district surveyor.

Mr. Richardson and Mr. Fowler supported the motion, the latter gentleman saying that it was to be regretted that in the present case the district surveyor had contented himself with giving notice to the builder, instead of taking out a summons against him.

Mr. Furniss, chairman of the Building Act Committee, said it was clear to him that the system of allowing district surveyors to carry on private practice as architects was a wrong one, and led to the neglect of their public duties. Something must be done, either by the Board itself or by Act of Parliament, to obtain more power of controlling the district surveyors, who, if thay were confined to their official duties, would be far more efficient officers.

Mr. Cook said the question before the Board involved a great and important principle, and he should be sorry if, through the apathy of the Board, the prosecution fell through. In the interests of the public generally, the Board ought to take up the prosecution. The rubbish used by speculating builders was so vile, and it was put together so rapidly and carelessly, that the only wonder was that such "accidents" as that in question were not of far more frequent occurrence. The evil had attained such alarming proportions that nothing but constant supervision would suffice to check it.

The motion was unanimously adopted.

The Superintending Architect reported on a letter received from Mr. John Turner, district surveyor for East Islington, stating that the term of three months during which his son, Mr. J. Goldicutt Turner, had been appointed by the Board to act as his deputy, had now expired, and asking that such appointment be renewed for three months longer. Mr. Vulliamy recommended that the application be granted, and

Mr. Runtz made a motion to that effect; but

Mr. Fowler thought there ought to be some understanding come to by the Board as to appointment of deputy district surveyors, both as to the limit of duration of such appointments and as to their renewal. He said this without any disrespect to Mr. Turner, who was an old and most exemplary officer of the Board.

Mr. Furniss said the whole subject of district surveyors and their duties needed consideration by the Board, not only in respect of the appointment of deputies, but in other directions. Indeed, he saw no remedy but in compelling them to devote their whole time to the performance of their duties,—in other words, to give up practice on their own account. Whenever a district surveyor was professionally engaged in connexion with a building, it was customary to appoint another surveyor to see that everything was in accordance with the Building Act. In such cases, the neighbouring surveyor was generally appointed. Each officer might almost as well be allowed to superintend his own buildings.

Mr. Selway said some discretion ought surely to be allowed to the Board in considering such applications as that of Mr. Turner, but the essence of discretion was that there should be no hard and fast rules such as those suggested by Mr. Fowler. In the present case Mr. Turner was quite capable of fulfilling, and, as a matter of fact, he believed he did fulfil, all the duties of his office with the exception that at present he was physically unable to climb a ladder. He was an old and most deserving officer of the Board, and it was but reasonable to grant his request.

The recommendation of the Superintending Architect was then unanimously agreed to.

At the same meeting of the Board, a report of the Building Act Committee was submitted, with respect to proceedings taken at the Westminster Police Court by Mr. E. D. Drury, district surveyor, against Mr. Hankey, with reference to certain buildings at Queen Anne's-gate, Westminster. The committee recommended,—

"(*a*) That subject to the opinion of the Superintending Architect to be stated in writing to the Board, the Board do not insist on Mr. Drury continuing the proceedings with regard to the height of the buildings; (*b*) that the Board do insist on the floors of the passages being made of fireproof materials, in accordance with the Building Act; and (*c*) that subject to the arrangement of fireproof doors being made to the satisfaction of the Superintending Architect and Captain Shaw, the Board do approve of the same."

The Superintending Architect (Mr. G. Vulliamy) presented a report with reference to this subject, in which he stated that, having regard to the satisfactory character of the materials and workmanship, he was of opinion that the Board might safely approve of the construction of these buildings to the height sanctioned by the committee.

Mr. Furniss moved the adoption of the report of the committee.

Mr. Dresser-Rogers complained of the air of semi-independence adopted by many district surveyors, after appointment, towards the Board. He thought the district surveyors should rather inform the Board of likely or probable infractions of the law. At the present time it was left until the work had been done, and thus the Board lost a fair opportunity of enforcing the law.

Mr. Runtz was afraid the previous speaker hardly understood this case. The Board consented to Mr. Hankey's plans for carrying his buildings to a height of 141 ft.; but when it was found that he had carried them to a height of 147 ft. he was summoned. It appeared, however, that the plan approved by the Board included a Mansard roof, and this might have made the total height of the building 150 ft. or 160 ft.; but in carrying his walls to a height of 147 ft. he proposed to omit the Mansard roof in consideration of the improved facilities that would thus be afforded for the extinction of fire, should anything of the kind occur. Under these circumstances, the committee recommended that no further proceedings should be taken.

Mr. Furniss said Mr. Hankey was quite willing to comply with these requirements of the Board.

HERR KRUPP, OF ESSEN.

SIR,—Your interesting articles upon the great gun-factory in Westphalia have no doubt been read with much curiosity by many readers, for in these troubled times a gunmaker is almost as important a man as a king-maker used to be years ago.

It may be pleasant to supplement what has been written, by a personal recollection or two of the man in person. Towards the latter end of '71, Herr and Frau Krupp, accompanied by their son and other members of the family, came over to England for the winter, and with much good taste pitched upon the prettiest watering-place in the country,—Torquay, as their home *pro tem.* One rather odd coincidence was, that the then recently-dethroned Emperor of the French was then residing in the same town, and indeed quite near to the great German's villa. But, after all, so many well-known people are accustomed to go to Torquay (it is wonderful how much they all look like common folk), that the existence of a couple—yea, or of a score—of this world's notabilities in the place at once, is no unfrequent thing. We happened to have a contract in hand upon the Strand there at the time, and as everybody, of necessity, comes once or twice a day along that live promenade,—we, as a matter of course, saw everybody. Nearly every day just before eleven the unfortunate Emperor would drive slowly by; but far more punctually, immediately after the strike of the hour, Herr Krupp, accompanied by a gentleman or two, and generally by his English stud groom, would ride by, always on horseback, never in a carriage. They generally took the lovely road round the bay, towards Paignton; and could return home after an hour and a half's airing. The Herr is a sparely-made man, between fifty and sixty, with a somewhat haggard face, long scanty beard and whiskers, the hair plentifully scattered with grey. He is not a graceful rider; but the "cabbies,"—and Torquay cabmen are really authorities on horseflesh,—have told me his cattle were the finest that ever came into the town. During the family's stay in England, Herr Krupp bought many hundreds of picked horses, and these used to be sent to Germany every week. The old gentleman never went personally horse-buying, to my knowledge; but his son and the stud groom I have seen a score of times at Newton Abbot and at Plymouth selecting the best obtainable animals. There was never a week passed, either, but that the pair paid a visit to a large horse bazaar, a few doors from where I reside in Exeter. Herr Krupp, jun., would then loll up against the wall by my yard, light a cigar, rub his glasses,—he always wore "specs,"—although not more (then) than about twenty-one, and possessing a beautifully full black eye,—and have the horses trotted up and down the street for his approval. The stud groom, who as I before said, is a Briton, and a particularly nice fellow, would light up too, and for hours together they would stand there chatting, whilst every really good horse that was brought out, after a little discussion, became the Herr's property. I have many a time felt right vexed to see such beautiful animals lost to the country. However, they were not "tight" with the money; and in what little business transactions I had with the family, I may say I found them to be thoroughly straightforward.

I remember being at Essen once, and the impression was that it was undoubtedly a vast place, but it did not impress me that such an amount of business "go" existed there as one was accustomed to see in the busy armour-plate times at such places as Sir John Brown's Cyclops Works at Sheffield. Further, unlike our English manufacturers, Herr Krupp is exceedingly jealous of visitors; indeed, it is only with the utmost difficulty that a foreigner gets a view of all that is going on in the works. Perhaps one of the greatest, if not the greatest, iron man that England has produced is the well-known Mr. Cammell, of Sheffield. Originally this gentleman kept a little "Tom-and-Jerry" shop in that town, and began manufacturing iron with three helpers. He now (or did recently) employs upwards of 5,000 hands, and, odd enough to relate, one of the original trio still remains in his service. I happened to execute a commission at his shooting-box, near Hathersage, in Derbyshire, a few years ago, and he told me then, with great glee, how he managed to see over the Essen factory. Many a time he went over purposely into Germany, but always without success, for under no circumstances would the officials admit him. Now it happened that in '51 Herr Krupp exhibited at our Great Exhibition. The German was unknown, and his exhibit met with no favour in the eyes of our countrymen; indeed, they were almost antagonistic to the foreigner. One of the few who pitied Krupp was jolly little Mr. Cammell. He invited the gunmaker to his hotel; and many a pleasant evening they spent together during the season. The Exhibition over, the friends parted, and never met again. Mr. Cammell resolved to take advantage of their old acquaintance; so, ordering his coachman to drive hard, and stop for no one, he boldly drove into the place, and straight across to Mr. Krupp's private office. Then, before anybody could say him nay, he bustled into the place, caught the German by the hand, congratulated him upon his looks, and reminded him that more than twenty years had rolled away since they, too, had spent cosy hours together in London. "And now," continued Mr. Cammell, "I've come across purposely to see your place. You must take me round yourself everywhere, and show me everything." Herr Krupp could not refuse his late host's bluffness; it took him quite off his guard; and all the plucky English manufacturer wished to see, he had opportunities for examining to his heart's content. I may add that Mr. Cammell does not think Herr Krupp's system will ultimately prove successful; and he considers our English guns by far the better weapons. May the day be far distant ere their comparative merits are tried; for we belong to one race; are associated together by a thousand kindred ties; and, after all done and said, it is very seldom that any good is obtained by "knocking up a row!"

HARRY HEMS.

THE MILL STATUE.

As our readers are aware, the statue erected on the Thames Embankment in honour of John Stuart Mill was formally inaugurated on Saturday last. One always looks with a good deal of interest, but not often with very much of hope, to any addition to the list of our public statues; a list including so many unhappy and unsatisfactory attempts. In the present instance the name of Mr. Woolner as the sculptor was a guarantee that the statue would, at all events, not be commonplace. As a fact, it is very much the reverse; there is an individuality and intensity of expression about the figure which quite takes it out of the category of regulation memorial statues. The author of the "Essay on Liberty" is seated, stooping forward with an eager look, while the right hand, resting behind on a book, serves to aid in keeping the balance of the whole figure. The intense expression of the thin worn features and sharp prominent nose is very well realised, and at once stamps the head as that of a man of no ordinary power: and the attitude of the figure has a great appearance of realism, suggesting "*sic sedebat.*" Yet, regarding the whole in reference to the conditions of sculptural art, we are led to question whether this very realism of action is not a

drawback to the work in an artistic point of view; whether a bust alone, on a suitable pedestal, might not have been a more graceful and pleasing memorial. For, in spite of the character in the attitude, the effect is not dignified and not sufficiently quiescent for sculpture. In front of the figure the effect of the whole pose is really bad and awkward, and from the left side of the figure also; the best view of it is the oblique one from the right, where the stooping figure gets the balance and support of the right hand and arm. The point we wish to draw attention to is that when the subject of such a statue was decidedly weak in physique, and the figure presented nothing specially suitable for effective treatment in sculpture, which was certainly the case with Mill (and even as it is we are inclined to think the sculptor has exaggerated his height in order to give more importance to the statue) it may be better judgment to give only a portrait-head rather than a whole figure, especially when the fame and achievements of the person represented were so purely intellectual as in this case. We may suggest as instances in which this has been ably done the monument to Alfred de Musset, illustrated in Daly's "Architecture Funéraire," and that to the painter Regnault, designed by MM. Pascal and Coquart, of which we gave an illustration in the *Builder* for Nov. 4, 1876. We advance this view on the principle that a sculptured portrait memorial should preserve that which was noblest in the external aspect of its original; and that to perpetuate an awkwardness of attitude or a defective figure, however characteristic it may be, is hardly in keeping with the real aim of monumental art.

The position of the figure, near the School Board buildings, and looking towards the seat of Government at Westminster, is in itself very suitable; and we may add, what cannot often be said of our public statues, that it is supported by an elegant and well-designed pedestal.

THE KINGSLEY MEMORIAL FOUNTAIN.

IT may be remembered that some time ago it was announced that the widow of the late Canon Kingsley had decided to erect a monument to his memory, which was to take the form of a drinking-fountain, and that her wish was that it should be erected in some part of the parish of Bermondsey. The fountain, which is said to be a handsome mural structure, is now completed, and ready for erection, but an unforeseen difficulty has arisen in reference to the Bermondsey site, and it now appears that that parish will not have the benefit of Mrs. Kingsley's gift. After a lengthened correspondence on the subject with the Bermondsey authorities, it seems to have been ultimately agreed upon that the fountain should be erected in Convent-row, a densely-populated district, where it might have been of great service to the inhabitants. The authorities of that particular locality, however, are said to have interposed some further obstacle, which has induced the widow of the late canon to withdraw her original proposal, and we understand that Poplar will now have the benefit which was to have been conferred upon Bermondsey, Mrs. Kingsley having placed the matter in the hands of the Metropolitan Drinking Fountain Association, with the expression of her wish that it may be erected in Poplar, and we learn that this will at once be carried out.

FOOTPATHS IN ST. JAMES'S PARK.

OUR attention has been directed to the very discreditable state of two of the main thoroughfares for foot-passengers in St. James's Park. One is the broad walk skirting the enclosed portion of the Park from the end of Birdcage-walk to the point opposite the Duke of York's Column. This is a walk not only largely used by "the many," who may have their right also to clean paths, but it is one of the most direct footways between the region of Westminster and Club-land, and as such is not unused by gaitered clerical dignitaries and statesmen high in office. Two or three months ago men were at work chipping and turning over the top of the soil with spades and picks, as if in preparation for putting some new finish on the path; but, if so, it has been thought better of, and since these operations, the footwalk has been dirtier and softer than ever, and in rainy weather is so bad that pedestrians take the carriage-way in preference. The other walk referred to is that leading up from the bridge over the Park water to the point opposite Marlborough House, the direct way between Pall Mall and Queen Anne's-gate and the St. James's Park Railway Station, and a thoroughfare very largely used: this is even worse than the other, and in rainy weather is a perfect ditch; and here the passenger has no choice of walking, being railed in on either side. Asphalte has been laid down on the walk between the Marlborough House and Buckingham Palace points, but there is much more regular foot-traffic *across* St. James's Park than along it, in the last-named centre walk especially. The walks in question ought at once to be properly laid with some material that will give a dry, clean surface; their present state is a source of constant discomfort, and very discreditable.

DIFFUSION OF SANITARY KNOWLEDGE.

AT the annual meeting of the Keighley Trade, Science, and Art Schools, Sir Henry Cole, C.B., distributed the prizes, and spoke well of what had been done by the town. At the close of his address, Sir Henry, after alluding to the teaching of domestic economy, said there was another subject he wished to mention, a very broad one, and one which he was sorry to say the northern counties were pre-eminently deficient in. It was what they might call the general public health question, or sanitation, as some called it. The present Prime Minister made a prominent feature of it. He had spoken of his Government as being distinguished by it, and he had used the phrase *sanitas sanitatum*. But the Government had not done much in the matter; they had done their best, in a little way, in an attempt to improve the health of those who lived in towns. What was to be desired was a diffusion of scientific knowledge among the people: then sanitary questions would make greater headway. Keighley was in advance of any large town in Yorkshire with regard to public sanitary matters. Leeds was really in such a deplorable condition that the clergy of all kinds ought to offer up prayer for its reclamation. Bradford, he was bound to say, was just one shade better; it did not pollute its river quite as much as they did, and it sent an effluent into its river very fairly pure, in fact very good, but, like Leeds, it was losing thousands of pounds every year by wasting what nature intended should not be lost. Dewsbury, Halifax, Barnsley, Rotherham, Sheffield, and Wakefield were all in a deplorable condition in that respect, but at Keighley he was glad to say they were better. The Bishop of Manchester had said that we ought not to stop amusements, but try to purify them, and he thought from what he (Sir Henry) had heard, that the managers of the Institute were trying to do that to some extent. It had been revealed to him that day, with a little hesitation, that during the last week they had had some country dances in that hall. Now, he thought that was an exceedingly good thing to do, and for his part he would say, if the lads and lasses attending the Institute had a weekly dance in that hall, it would be turning the place to a very good account. He therefore hoped they would not leave dancing to the annual festival, for it was a very good and healthy exercise, and young people ought to enjoy it. The speaker went on to urge the importance of teaching music in a thorough and systematic manner at mechanics' institutes, and concluded by saying that he thought it was highly advisable that Keighley should be incorporated, for there were many things which a corporation could secure which a Local Board or Board of Health could not. His parting advice to them, therefore, was to determine to get a corporation as soon as they could.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

AT the meeting of the Society held on the 24th ult., Mr. C. H. Driver, V.P., in the chair, a paper on Chimney-shafts was read by Mr. R. M. Bancroft, past-president of the Society. After drawing attention to the wide differences of opinion between various authorities who have written on the subject, especially with regard to parallel and taper flues, and whether chimneys should have a regular batter or outline similar to the theoretical diminution of columns, which, it was said, should have a slight swell in the centre of their length, the author proceeded to describe upwards of forty chimneys which the different owners and designers had supplied him with particulars of. These he had tabulated, to show at a glance height, thickness of walls, proportions of diameter to height, weight, cost, time of building, &c. He drew attention to the designs of caps, and in one case noted where a cap had cost 700*l.* in repairs and removal after the stack had been completed. Mr. Bancroft then drew attention to the difficulties in straightening chimneys when out of the perpendicular, and mentioned several successful cases where this had been done; but in one example, through neglect, a fatal accident and much damage was caused. Taking down old chimneys was also descanted upon, and a chapter on lightning-conductors concluded the paper.

A discussion followed, in which the vice-president, Messrs. Perrett, Payne, R. H. Twigg, Willcocks, Howard, Street, Munday, and Hill took part. The meeting was then adjourned till Thursday, February 7th, when a paper will be read by Mr. A. F. E. Grant on Richmond Waterworks.

THE WORKMEN'S BUILDINGS IN PECKHAM AND THE METROPOLITAN BOARD OF WORKS.

SOME time ago, as our readers know, the Board issued two summonses against Mr. William Nunn for the infringement of the Building Act in reference to a block of buildings which he is at present erecting in Choumert-road, Peckham. One of the summonses alleged that the infringement of the Building Act consisted in the ventilation and general sanitary arrangements of the buildings having been so far disregarded as to render the several tenements absolutely unhealthy. The second summons had reference to the width of the street leading from the buildings. On the occasion of the first hearing of the summonses the case was adjourned in order to enable the magistrate to view the premises, and having done so, he (as reported in the *Builder* at the time) gave his decision against the Metropolitan Board, dismissing both summonses with costs, the provisions of the existing Building Act not being sufficiently definite to meet the evils complained of by the Board. Since the decision was given the Local Government Board have been requested to take action in the matter, but they have declined to do so. The general purposes committee of the Camberwell Vestry, in whose district the buildings are situated, have, however, recommended that, in relation to this matter, the Metropolitan Board take steps in the present session of Parliament to obtain the insertion of a clause in the new Building Act which they are promoting, in order to alter, as they state, "such an anomalous state of the law," and we understand that the Board have agreed to apply for such a clause to be included in the Bill.

Mr. Nunn has, it is said, a ground of complaint in that the district surveyor raised no objection to the plan adopted till the building was nearly finished.

ELECTRIC LIGHT.

AT the Institution of Civil Engineers, on the 22nd of January, the paper read was on "Some Recent Improvements in Dynamo-electric Apparatus," by Dr. Higgs and Mr. Brittle, C.E. A description was given of the latest construction of Siemens's dynamo-electric machine and electric lamp, the latter devised specially for lighthouse illumination, and similar lamps were about to be supplied for the Lizard Lighthouse.

Much excitement had been evinced as to the probable competition between gas and electricity, as sources of light-power. Although, under certain circumstances, these two agents undoubtedly came into competition, they had two separate fields. Hitherto gas had been employed for lighting spaces of both large and small dimensions, because a better source of light for large spaces had not been procurable with economy. But for lighting large spaces not subdivided by opaque objects or screens, it was a want of economy to employ gas. Assuming light-power proportional to horse-power expended, 100 horse-power would give 150,000 candles' light; distributed from three points, the cost would not be more than 1*l.* 2*s.* 6*d.* per hour, each light-centre giving an illumination which would enable small print to be read at a distance of quarter a mile from the light. A burner giving the light of twenty candles consumed six cubic feet of gas per hour, which might be

manufactured at a cost of 2s. per 1,000 cubic feet. This gave 7,500 burners' light only, and 45,000 cubic feet of gas at a cost of 4*l.* 5s. per hour, a ratio of 4 to 1 in favour of electric lighting. The economical ratios differed greatly, being dependent chiefly upon the price of gas and of the motor power employed. For large spaces the cost of electric lighting was about one-fourth, or even one-fifth that of gas lighting, when steam had been used as power, and wear and tear were reckoned. With a gas engine as motor, the ratio had only been as 1 to 3, the greatest economy having been with a turbine as motor. At M. Dieu's workshops at Davours, the cost per hour for gas was 2s. 0·632d. against 1s. 7·2d. for electric lighting. M. Ducommun found, taking into account wear and tear and interest, that gas cost 2·25 times more than the electric light, which ratio was increased to 7·15 when wear and tear and interest were left out of consideration. At Messrs. Siemens Brothers' Telegraph Works the economy was as 2 to 1 in favour of electric lighting. If, however, the ratio of light-intensities were adopted as the ratio of efficiency, the advantage would be considerably higher (20 to 1) in favour of electric lighting. It might be laid down as proved by experience, that for lighting large spaces, not too much subdivided, the advantage was greatly in favour of the electric light; but that where numerous light-centres of small intensity were required, or where the space was much subdivided, the advantage was in favour of gas. This advantage would cease when a practical method of subdividing the electric light was obtained.

THE BOWES MUSEUM.

THIS fine building which, since the latter end of 1869, has been in course of erection at Barnard Castle, may now be said to be approaching completion. Since its foundation was laid by the late Mrs. Bowes, better known, perhaps, as the Countess Montalbo, the edifice, which is palatial in its extent, has slowly grown up, story by story, until the "Josephine and John Bowes Museum" gives promise of being the finest erection of its kind, not situated in one of the larger cities of the kingdom, to be met with in England. Extending to a length of over 300 ft., built in stone with all the grace and strength characterising the best period of French Renaissance, and fronted with a terrace and gardens, which will recall the finest specimens of Parisian taste, the Bowes Museum stands almost unrivalled among similar constructions. Particularly fortunate in its site, the noble lines of the building are not spoiled by contrast with meaner accessories. Unfortunately, Mrs. Bowes, dying in 1874, did not live to see her work completed. It has, however, been carried on by Mr. Bowes with a tender solicitude that nothing should be wanting to make the Museum what it was originally intended to be, and the several principal rooms already completed show that his wishes will be more than realised.

Entering the Museum through a bold circular-headed doorway, 24 ft. by 6 ft. high, the principal hall and grand staircase are reached. These are lined with polished ashlar stonework. The entrance-hall is about 42 ft. square and 31 ft. high. The cold and severe effect of the freestone employed in its construction is, in the lower part of the hall, relieved by polished supports of Peterhead granite, which carry the landings communicating with the museum or first floor. Passing under massively-decorated stone arches, the visitor, leaving the entrance-hall behind him, ascends a broad flight of polished granite steps to reach the first landing above, which is constructed of huge slabs of Craigleith stone. Right and left of the landing, to which the grand staircase gives access, are the two end wings, or end pavilions, the passage communicating with them being 9 ft. wide. In the first floor, which is built upon twelve solid stone-arched basement rooms or cellars, are the triad of museum or exhibition halls. Their total measurement is 200 ft. by 45 ft. Down the centre run three series of five lofty polished Dunhouse stone columns, which support the floor above. These art-galleries have a total height in wall-exhibition space of 28 ft. Above this they are carried a further height of 22 ft. The principal decorations are in buff and chocolate. The lighting is by flat roof-windows inserted under the outside lights. The picture-rods are secured in supports fixed into lead-plugged sockets, which are let into the main walls of the building. Moulded bases and panels decorate the dado in each of the three rooms. The galleries, it may be stated, are copies of one at Munich. Altogether there are over 100 rooms in the Bowes Museum. The masonry was finished five years after the building was commenced, and the last three years have been spent in fitting up the interior. In front of the museum, a terrace, 372 ft. in length, is being constructed. It is to be ornamented with a series of rock-faced stone panels, with circular and square-headed recesses for the insertion of groups of statuary.

To the east of the Bowes Museum has recently been commenced the memorial chapel, in which it is intended to place the remains of the late Countess, to whose munificence Barnard Castle will be indebted for the princely gift of the Museum and its contents.

Both Mr. Watson (Newcastle), the architect, and Mr. Kyle (Newcastle), the builder, have evidently striven to plan and erect a building which should last, if not for all time, at any rate for a far longer period than most contemporary buildings. The total cost of the Museum, as it stands, will be about 100,000*l.*, exclusive of the 25 acres of ground on which the Museum and Chapel stand. Illustrations will be found in one of our earlier volumes.

PROPOSED NEW VESTRY-HALL FOR BERMONDSEY.

THE question of erecting a new Vestry-hall came before the Bermondsey Vestry at their last meeting. It was stated that the room in which the Board now met did not belong to the Vestry, and that the only office they possessed was a hired one. It was urged that in a parish of that extent, with a valuation of 400,000*l.*, they ought to have offices worthy of the parish, as other parishes of less rateable value than this, and also of less importance, possessed suitable office buildings. Several members spoke strongly in favour of the proposal.

A resolution was passed to the effect that the Board at once take into consideration the question of providing a new Vestry-hall and offices for the transaction of the business of the Board.

SOCIETY OF BIBLICAL ARCHÆOLOGY.

SIR,—With reference to your recent kindly notice of this Society, allow me to state that the council had a type of Cypriote cut expressly to illustrate the "Tablet of Dali," Mr. George Smith drawing the characters himself. In the like manner, when Capt. Prideaux began his series of papers on the Himzeritic language, a special arrangement was entered into with Messrs. Harrison to cut a fount of that type also, the Society contributing towards the expense of the same. We were further prepared to cut the Hamethite characters as well had there been a sufficient consensus among scholars as to the exact form of the hieroglyphics to be selected; and I must add with praise that the late George Smith promised me that he would draw up such a type of the Hamethite characters when he should return from his third expedition to Nineveh, that third and fatal journey from which he never came back.

W. N. COOPER, Secretary.

THE SO-CALLED LAW OF ANCIENT WINDOW-LIGHTS.

SIR,—I was glad to see the article in your paper of January 26. You say, very truly, that the absolute necessity for revision of the present laws regarding window-lights must be brought home to the Legislature. The law as it now stands does place a weapon in the hands of evil-doers, and it is a weapon which will be more frequently used as the evil-doers find out that they possess it.

The Act of 1832 was probably intended to define a right of light as one "actually enjoyed for the full period of twenty years without interruption," owing to the difficulty of proving, in a court of law, the existence of an "absolute and indefeasible right of light from time immemorial." The Act could not have been intended to have the effect it has, and will continue to have, until it is repealed or altered.

Two cases have lately occurred in my own experience, in which the "dominant" owners broke out window-lights overlooking the neighbouring property, and asserted their right to do so; "we can break out any lights we please, and you can, if you choose, block them up." And the lights were blocked up, by erecting expensive screens of timber and boards, at the cost of the "servient" owner. Ugly and expensive robbery and annoyance, by Act of Parliament.

Another case was told me by a brother architect as having occurred within his knowledge. Two neighbours lived on excellent terms. One of them, finding his back kitchen rather dark, requested and obtained verbal permission to open a window light over his neighbour's yard. In the course of time, the obliging "servient" neighbour died, and his son, wishing to make some additions to the premises, had to pay 150*l.*, after considerable litigation, to purchase that right of light, which had then been allowed to remain a little over twenty years.

In point of fact, a man who opens a window-light over his neighbour's property commits a trespass, and injures the property of his neighbour; and such an act ought to be made amenable to the laws of trespass, with greater strictness than any other, because it is a more dangerous and more insidious trespass.

W. JACKSON.

ART EDUCATION IN MANCHESTER.

THE *Manchester Courier* says that the revised Art Museum scheme for Manchester contains the following suggestion, prepared by Mr. J. H. Nodal, at the request of the committee, for the Art Museum in relation to schools and workmen's clubs:—

To Mr. Horsfall's scheme, which contemplates one central art museum only, the committee have thought it desirable to make an addition. They propose to place collections of works of art in the Board and other elementary schools of the city and in working men's clubs. A single museum is obviously an inadequate provision for a widely-extended town like Manchester, and, unless supplemented, it would but imperfectly fulfil the purposes described in Mr. Horsfall's pamphlet. But the Board schools and working men's clubs supply a means of spreading the influence of the museum and its works over a wide area, besides attaining some ends which even the central institution would be powerless to accomplish. The idea is to spend a portion of the funds at the command of the committee in the purchase of really fine drawings, casts, and artistic reproductions, which shall be suitable in subject and character to the minds of children, and shall interest them in the same way as the works in the central museum will interest grown-up people. These it is proposed to arrange as attractively as possible in the Board schools and in any other elementary schools, the managers of which are willing to work with the committee. If arrangements can be made, and there is little doubt they can, the schoolrooms might be opened on certain evenings to the parents of the children and the people of the neighbourhood, and, as in the central museum, there might be given some music and readings, and simple explanatory addresses. A similar plan might be followed with regard to working men's clubs. It is difficult to exaggerate the importance of bringing children under the influence of really beautiful forms of art. The silent education of the eye has been too little considered in our educational systems. Moreover, the teachers of our Board schools would gain greatly by the proposed scheme. They urgently need, and would be much encouraged by, the countenance and sympathy of those who may be expected to work with the art-museum committee. Unlike the teachers in voluntary schools, who can generally depend for counsel and encouragement upon the clergymen, ministers, and members of the congregations, the masters and mistresses of the Board schools occupy a somewhat isolated position. Their connexion with the members of the School Board is necessarily little more than official. From the parents of the children they can look for little or no aid or sympathy, and it would undoubtedly be a great gain to them, and would give an impulse to their work, if their several schools could be brought within the range of a more general and public recognition, such as the plan of the art-museum committee is calculated to accomplish.

"DID ANGLO-SAXON SLAVES WEAR COLLARS?"

REFERRING to my letter to you, which appeared in your impression of the 19th ult., I now beg to hand you the inclosed (with permission) copy of a letter I have received from Mr. E. Armitage, R.A., on the above subject. Perhaps some of your readers can give further information. FREDERICK DAVIS.

"Dear Sir—I am very grateful to you for having taken so much trouble about the collar question. My correspondence with Mr. Freeman took place in October, 1876. It was, therefore, of ancient date, and was published accidentally without my knowledge.

The picture was finished in time for the Royal Academy Exhibition of 1877, and is now in the Walker Gallery at Liverpool.

'Fosbroke' is certainly mistaken in saying that an iron collar was worn by the Saxon slaves; they were worn by the ancient *Roman* slaves, but never by a *British* serf. This I ascertained, beyond the possibility of doubt, before finishing the picture.

Mr. F. Palgrave, in his great work on the Normans, mentions Gurth's collar as an instance of a popular mistake; but perhaps the best evi-

dence against collars is their non-existence in any museum. Saxon necklaces, armlets, bracelets, and even toothpicks, are common enough, but no iron collars.

Those you mention in your letter are either Roman or else are collars for criminals. British serfs were sometimes branded on the shoulder with the name or the mark of their master; but this was not often done.

When I told Mr. Freeman that I had searched in vain for any account of these collars, I meant that I had not found them mentioned in *several* histories of England (the Pictorial amongst others). Subsequently, through the kindness of the British Museum officials, and also through Dean Stanley, I satisfied myself of their non-existence.—E. ARMITAGE."

OPEN SOIL-PIPES.

SIR,—I should like to ask if Mr. Norman Shaw's improvement in the arrangement of closets and soil-pipes has been exposed to the trial of actual daily use during a period of continued severe frost?

As far as my experience goes, the danger of stoppage in frosty weather is the chief drawback to the principle of disconnexion when applied to sink and other wastes. This courageous and consistent extension of that principle to our greatest domestic nuisance and convenience seems to me exposed to risk from the same cause. I should fear that first icicles, then a plug of frozen sewage matter, and then a total stoppage would form in a hard frost at the point of disconnexion, and if this cannot be prevented, or has not been shown by sufficient experience not to occur, the improvement, great as it promises to be, can hardly be safely adopted.

I hope Mr. Norman Shaw will not object to reply to this question through your columns, as both question and answer bear upon this most important subject very directly.

T. ROGER SMITH.

SIR,—The correspondence upon this subject will, I trust, be the means of greatly advancing our knowledge as to the utility or otherwise of such a revolutionary method of soil-pipe construction as that advocated by Mr. R. Norman Shaw in your issue of January 12th. For my own part I must confess to some misgivings upon the point, and incline to the opinion of Mr. H. Saxon Snell, that a coating of excrement will be formed, if not upon the whole length of soil-pipe above the syphon-trap at foot, at least in that portion of it immediately below the closet, where its position is nearly horizontal. A very important consideration is urged by Professor Fleeming Jenkin, who points out that upon Mr. Shaw's own showing the water-closet he describes, although deprived of its water-trap, is of the Bramah pattern. As the valves of this type of closet are by no means absolutely certain to remain air-tight, the question arises whether Mr. Shaw would be satisfied with this construction of soil-pipe when provided with nothing but an ordinary open hopper as the closet apparatus. There is, in my opinion, one very serious objection to the adoption of such an arrangement in the liability to the spread of infection from the specific poison of enteric diseases. Assuming that Mr. Snell's surmise is well founded, and that a coating of deposit, however slight, is formed in any portion of the soil-pipe, there will be a danger of polluted air rising from the soil-pipe into the hopper, and thence into the house. As to the probable nature of sewer-air produced under such circumstances, there is a remarkable paragraph in Dr. Buchanan's Report to the Local Government Board upon the outbreak of enteric fever in Caius College, Cambridge, in 1873.

Commenting upon the supposed access of specifically polluted sewer air to the college water-supply through a closet-trap emptied by atmospheric influences of its water, he writes as follows:—"Sewer air, as such, finding its way to the water-pipes, would probably be more dangerous than sewer air that reached them after having been absorbed by and evaporated from water; for the latter sort of air could only contain *volatile* impurities, while the former would contain *particulate elements* as well; and it is probably *in such elements* that any specifically injurious quality of sewer air resides." The italics are my own. Unless such a statement as this is to be ignored as entirely worthless (and I should hesitate before doing so), I think it will be conceded that whatever means be adopted for the disconnexion and ventilation of the soil-pipe, the trap below the closet-hopper should still be retained, although there is no doubt that many forms of trap now in use are objectionable. I trust that the experiments suggested by Professor Jenkin will be duly tried, and that Mr. Shaw or others interested will communicate the results to your columns.

JOHN S. HODGSON, C.E.

WE can give our testimony to the excellence of the system of drainage described by Mr. Billing. We have carried it out in many places, and with the best effect. We also tested it in a block of offices where five waterclosets lead into one stack of soil-pipe, with only one trap, and that at foot of soil-pipe. These continue to work without the slightest smell. We find that valve-closets should be used, not pan-closets.

ASHBY & HORNER.

SIR,—The usual arrangements of soil-pipes may be conveniently divided into three classes, viz.:—

(A.) Closed and trapped, without ventilation.

(B.) Closed and trapped, with ventilation.

(C.) Open and untrapped, and therefore self-ventilated.

As to A, comment is needless, because ventilation in some form is a *sine quâ non*.

As to B, If correct ventilation be established the remaining point is the position of the trap.

Now a trap at the top of the soil-pipe seems *primâ facie*, more desirable than a trap at the foot; for, surely, there is less danger of exhalation from a trap alone, than from a trap and soil-pipe combined.

It is argued that with the trap at the bottom (both pipe and trap being ventilated), no foul air enters the building from either.

But is this a practical fact? Is it actually the case that ventilation of either one or both is constant and complete under all conditions of the atmosphere? Has it been demonstrated that, where unequal temperatures exist in different portions of any given soil-pipe, which may be partially inside and partially outside a building, *all* foul gas escapes at the highest orifice of the ventilating shaft, and that none finds its way into the building? Besides, cannot a trap at the top of a soil pipe be as completely ventilated alone as a trap placed at the bottom and ventilated in conjunction with the soil-pipe?

However varied opinions may be on these points, it will doubtless be conceded that in every sound and proper system of drainage by closed pipes, the following rules should be scrupulously adhered to:—

1. That a water-trap divide the sewer and house drain.
2. That each section of pipes be ventilated by a shaft of adequate dimensions, so arranged that fresh air can enter as freely as foul air can escape.
3. That all pipes and joints be absolutely air-tight.

Very scant attention is bestowed on the last rule, even in vertical pipes above ground; while in underground drainage the mere suggestion of making the whole system air-tight is commonly smiled at as chimerical, even by some thoughtful and distinguished men. Yet, as a matter of health, air-tight drain-pipes inside or underneath a building are just as necessary as air-tight gas-pipes.

The merits of system C were exhaustively placed before the public by Mr. R. Norman Shaw, in your issue of the 12th, and so ably supplemented by Mr. Rogers Field, in your impression of the 19th inst., that further explanation is unnecessary.

The advantages of this arrangement are self-evident. All trapping of soil-pipes is abolished, and thorough ventilation obtained. With an air-tight drain under the building, all inlets to the same placed outside, soil and all other pipes disconnected therefrom, no sewer-gas can be generated, or possibly enter the building.

There can be small doubt that, with a quick fall to the soil-pipe, a good flush of water, and pipes of proper diameter, this system is eminently satisfactory, and will be rapidly adopted by all who crave for healthy houses. It further has the substantial recommendations of simplicity and economy.

WALTER BUCKERIDGE.

CLEOPATRA'S NEEDLE.

SIR,—Now Cleopatra's Needle has arrived, and awaits its destination, would it not be worth while to make one more effort in your journal to avert such a *dénouement* as its erection in Parliament-square? The curious thing is, that this site has been approved by several "eminent architects"; but, surely, one consideration alone should suffice to decide the question, viz., that the whole of this particular site is as it is such an assemblage of incongruities that, to add one more, by the presence of this ancient monument, would cap the absurdity to a degree, and furnish one more example of the unfortunate mistakes which have made our public sites and buildings the laughing-stock of Europe. From whatever point viewed the jumble is startling. The Crimean Memorial in the Broad Sanctuary, the Abbey, St. Margaret's, Canning's colossal statue,—as compared with others of a different size, and which even are not uniform as to size of figure or design, and height of pedestal,—the *bizarre* fountain, the medley of lamps and railings, make an *ensemble* from which every element of repose is lacking; while the marked characteristic of Egyptian architecture is repose, and it is evident that nothing but an open, unobstructed site would be congruous with this interesting memorial of the past.

Referring to the whole site of Parliament-square,—how much was lost by the abandonment of Sir C. Barry's design for completing the quadrangle of New Palace-yard! The present gaunt aspect of the Clock-tower and the array of garish lamps are most unfortunate. Is it too much to hope that, on the completion of the New Law Courts, and the removal of the Westminster Courts, the original design will be carried out in its entirety?—"a consummation most devoutly to be wished for."

B.

WE have received a letter from the President of the Institute of Architects advocating the claims of a site proposed in our columns early in the discussion,—that in St. James's Park, just inside the iron inclosure, and opposite the centre of the Horse Guards. Our flag, however, is marked "Embankment," as from the first, and we have nailed it to the mast. The model, as our readers know, is to be tried on the Embankment presently; and we are much pleased to hear that the Parliament-square site, at any rate, is abandoned.

THE MASONS' STRIKE.

SIR,—A letter in your important organ of the trade, from Mr. Harry Hems, on the above subject, has attracted my attention, and caused me to look for him in the "London Directory" in vain. I wanted to know what manner of man he was who approved of 4d. masons! Mr. Hems refers to the case of Mr. Macey, a well-known builder, who was summoned by a mason, and it came out that Mr. Macey can get men at from 4d. to 9d.! Perhaps this accounts for the extraordinary difference in estimates which we so often find in your columns. But great is the mystery of contracts. In the City of London paving is supplied at 6½d. a foot, which, according to the builders' price books, is worth 14d. per foot at least. How they work that little game is a problem which I mean to solve one of these fine days. However, as a master mason of twenty-five years' standing, I do not believe in treating the men as enemies, but as fellow-tradesmen. They have a right to put a price on their work, just as we have on ours, and they have an equal right to combine to fix a price as we have. If you were buying a pig from one of your men, you would ask him his price for it, and he would have a right to put a price on it, as he has a right to put a price on his labour. I do not think this masons' strike was well timed or advisable, but the men were honest and honourable enough. They gave six months' notice, and offered to meet the masters and arbitrate. Your correspondent, "Z," says, "I would meet no workmen's deputation," &c. Well, that is tantamount to saying that "Z" must fix the price and hours of other people's labour, and they must have no voice in the matter. As to the regulation of apprentices and foremen, that is one of those things, as the song says,—

"We often hear about, but very seldom see."

There are so many Carlton Club scandals floating about regarding trade unions, invented by aristocratic idlers and tax-eaters, that I am surprised at "Z," who says he is a practical man, repeating the gossip of a lot of thimble-riggers, who know no more about building than spinsters, and never did a day's work in their lives. It is of no use to oppose trade unions now. What are clubs, and inns of court, and universities, and halls of various professions, and a State Church, but trade unions? The upper and middle classes have had their guilds for ages, why not the mason? Why cry out, "Enough! enough!" so early in the case of the poor mason, when you have allowed the barristers and lawyers to prey upon the public with their exclusive arrangements so long? Why do not the builders and master masons have a trade union, not to cut the men's throat, but to stop the cutting of one another's throat? It is notorious that during a lock-out many builders will pick out the best men, and give them the advance on the sly. But I think if only the spirit of arbitration were to animate masters and men, these strikes and locks-out would be prevented altogether. The trade-union leaders are not such violent men as not to listen to reason. They are the statesmen of labour, and they would be only too happy to meet the kings of capital if these mighty Cæsars would condescend to receive them as ambassadors. But while all parties are so stiff-necked, disputes *will* occur, and great harm is the result

If the masters would show a willingness to meet the men, they would get on all the better.

I can remember when Trego's men had to go to the City by the penny boat to be paid. There was a great fuss made about the four o'clock movement at that time, but the end of all this stiff-neckedness was that the masters conceded more in the end than they would have done by arbitration. True, the men suffer much; and I think if a little more consideration were shown for the homes of the working men than to deal out "the sack" wholesale without any previous notice,—as is too often done,—the men would not fail to return the compliment.

The Germans and other foreigners are, no doubt, very good masons, but English masons are unsurpassed, and I believe they will pay their masters very well at the price they charge for their labour. No one regrets these disputes more than I do. I say, let capital be respected; let labour be respected; and with mutual respect and confidence Englishmen will at least get on as well with one another as they will with Yankees or Dutchmen, to say nothing of the Chinese and Japanese, who will next be invited over, I suppose, to build our future monastery-prisons, charitably termed "courts" and palaces. I have been at meetings of masters, and I have noticed that those who carry the sway are young college-bred gentlemen, sons of builders, but not themselves practical men. Practical men know that the unionists are the best workers, and they do not want to lose their valuable services. Those who attempt to crush societies are doing a foolish and suicidal thing. They tried to crush the engineers, and what was the result? The engineers are the strongest society in the world. The man who would crush the masons is no friend to the masters, the men, or the country at large.

A MASTER MASON.

*** We have been most anxious throughout this disastrous dispute to allow the friends of both sides to state from time to time their views, and have in consequence permitted here and there assertions to be made which we knew to be exaggerated. Our present correspondent, for example, a well-known master mason, speaks of men "who would crush the masons"; but we do not know of any such attempt. The masons say they must have 10d. an hour; the masters say they cannot pay so much, and are doing their best to obtain the same sort of labour at a cheaper rate. What further loss, waste, and distress will come of the struggle, we deeply regret to have to say, it yet remains to be seen. "Master Mason" would also have it understood that the men would leave the question to *arbitration*; and another correspondent, who describes himself as "A Mason on Strike and a Delegate," asserts the same thing. We feel bound, therefore, to state, as we can without betraying what might be considered confidence, that the difficulties which have intervened to prevent this most desirable step were not raised by the employers.

WOOD PAVEMENT.

SIR,—There was a paragraph in your paper of the 19th ult., inquiring why the wood pavement in Piccadilly was being restored. I am glad, therefore, to give you the following information.

The pavement was laid nearly five years ago, on this company's original system of double flooring-boards. This system has been for some time abandoned, principally on account of the sinking of the soil beneath the boards, resulting in the blocks becoming loosened and separated. The pavements recently laid by this company in the City, the Strand, at Derby, &c., on a bed of concrete, are as solid as any pavements can be made, and the joints between the blocks being cemented with asphalte, no water can possibly penetrate.

The company has relaid a large area laid on the original system, where defective from bad foundation, and has promptly fulfilled every engagement for maintenance and repair. This has only been done by great outlay, and the experience of nearly six years has proved that no wood pavement can be substantial unless the surface water is effectually kept from penetrating to the foundation. All the various fancy systems with material between the blocks and the foundation will soon be things of the past.

ARTHUR R. GRENFELL,
Chairman, Improved Wood Pavement Co.

THE FALL OF HOUSES IN THE HAYMARKET.

AT the meeting of the Metropolitan Board of Works, on the 25th ult., a report was brought up from the Building Act Committee with reference to the fall of two houses, Nos. 22 and 23, in the Haymarket, on Thursday night, the 17th ult. The report stated that the subject had been under the consideration of the committee, who had conferred with Mr. Robert Walker, the district surveyor, thereon, but that the ground at the present time was entirely covered with fallen materials, and until these were cleared away and the basement exposed, it would be quite impossible to form an opinion as to the cause of the accident.

Mr. Furniss said the committee were not sufficiently advanced in information to be enabled to report fully on this subject, but as the public mind was somewhat excited on the question, they thought it best to bring up this interim report, in order that the public might know that the matter was receiving every attention, and that a full and ample report would be submitted on a future occasion.

The Clerk subsequently laid before the Board a letter from the Home Office, requesting that a report may be made to the Board on the subject of the recent fall of two houses in the Haymarket, and that a copy of such report, when made, may be sent to the Home Department for the information of the Secretary of State.

The Chairman stated that he had taken care to inform the Home Secretary that this subject was being inquired into by a committee, and that the results of their investigations would, he had no doubt, be forwarded to him.

ROYAL FREE HOSPITAL, GRAY'S-INN ROAD.

ON Thursday, the 24th ult., the new wing that has recently been added to this hospital (to be called the Victoria wing) was opened by the general committee, all formal ceremony being deferred until the whole of the proposed additions are completed; by this addition the total accommodation of this valuable institution has been raised to 150 beds. The Victoria wing contains three wards, ward staircase, and general accommodation for the out-patients' department. Each ward is 104 ft. in length by 22 ft. in width, and holds sixteen beds, giving a cubical air space of 2,000 ft. per bed. The baths, water-closets, lavatories, &c., are placed in a small block at the side of the wards opening direct from them, and are so arranged that a through current of air is obtained for ventilation. The out-patients' department contains large waiting-rooms for males and females, physicians and surgeons' rooms, dispensary, and waiting-hall, affording accommodation for the relief of 500 patients daily. The works have been carried out from the designs and under the superintendence of Mr. Wm. Harvey, the architect to the hospital, at a cost of about 13,200*l.*, Mr. Shepherd, of Bermondsey, being the contractor. The floors throughout were constructed on Messrs. Dennett's fireproof system; the tanks, hot-water apparatus, and service were fixed by Messrs. Turner & Co.; and the lavatories, closets, and copper sinks, &c., were supplied by Messrs. Tylor & Sons.

PENGE NEW WESLEYAN CHAPEL.

THE memorial-stones of a new Wesleyan Chapel at Penge, Surrey, were laid on the 17th ult. It will occupy a position facing the southern end of Oakfield-road. The style of architecture will be Gothic, freely treated. The front will have a tower and spire rising to a height of 150 ft., and a central gable, the upper part of the latter being almost filled with a triplet arrangement of traceried windows, the lower part being occupied by the principal doorway. The sides will be divided into six bays, each of which will have triplet windows, with tracery and arched heads. The two southernmost bays on each side will be treated as transepts. The chancel will be at the south end of the chapel. The staircases will form features of the design, one being between the gable and the tower, with entrance from the tower, and the other being on the eastern side of the gable.

The interior of the building will be divided by three aisles, so as to allow of a number of small pews being obtained, the whole of which will have open ends. The chancel will have a curved ceiling thrown into panels by moulded ribs, with moulded and enriched frieze along the walls. The organ-chamber will be on the east side of the chancel, into which it opens, as well as into the transepts. The vestries will be on the west side of the chancel. A gallery, supported on columns, will extend round three sides of the building. The roof will be in one span, so that there will be nothing to intercept the view of those who occupy the gallery, and will be divided into six bays by moulded and framed principals of pitch pine, having perforated spandrels, and supported on moulded stone corbels. A ceiling will be fixed for the sake of acoustic results and freedom from down-draughts. The total number of sittings provided will be 1,046. The external walls will be of Kentish rag, with Bath stone dressings.

The total cost of the building will be 8,000*l.* The architect whose design was chosen in competition is Mr. C. O. Ellison, of Liverpool; and the contract for the whole of the work has been let to Messrs. J. & C. Bowyer, of Upper Norwood.

AN ARCHITECT'S CLAIM AGAINST A BUILDER.

AT the Lambeth County Court, last week, Mr. Lockhead, an architect, residing at Tooting, claimed 23*l.* from Mr. Snelling, a builder, of South Lambeth-road, for professional services rendered to the defendant in preparing plans, elevations, and sections for ten new houses in South Lambeth-road, and three shops in Stockwell-road. The case turned upon the question whether the plans were satisfactory. The defendant had paid 10*l.* into court.

On behalf of the plaintiff it was stated that at the request of the defendant he viewed a site for him in the South Lambeth-road, which led to his employment by the defendant in connexion with the houses and shops in question. He was occupied seventeen days in preparing the plans for the buildings, and the defendant had expressed entire satisfaction with them. When, however, the bill was sent in, he objected to the charge, and although he (the plaintiff) offered to refer the matter to Mr. I'Anson, the architect to the estate, the defendant objected.

Mr. Gibson, architect, was called on the part of the plaintiff, and stated that the ordinary professional charge was 5 per cent. on the outlay, if the plans were carried out; but for such work as that on which the plaintiff had been engaged the charge was 1½ per cent., and 3 guineas the minimum charge per day. He thought the plaintiff's charges were perfectly reasonable and consistent.

It was admitted on the part of the defendant that he had in the first instance expressed satisfaction with the drawings, but that when submitted to the ground landlord they were not approved of, and another architect had to be employed to prepare the plans in accordance with which the buildings were eventually erected.

Professional evidence was given on behalf of the defendant to the effect that the plans furnished by the plaintiff were only preliminary ones, and not worth the sum charged by the plaintiff.

In the absence of any agreement between the plaintiff and defendant, as to any particular sum to be paid for the plaintiff's services, the judge said the question was whether or not a reasonable sum had been charged. He was of opinion that the plaintiff had charged more than he was entitled to, but at the same time he did not think that the 10*l.* paid into court by the defendant was sufficient, and he therefore awarded him 5*l.* in addition.

CASES UNDER METROPOLITAN BUILDING ACT.

DISTRICT SURVEYOR'S FEES.

A SUMMONS was heard by Mr. Bridge, at the Hammersmith Police-court, on the 19th ult., which had been taken out at the instance of Mr. T. E. Knightley, district surveyor for Hammersmith, against Mr. Thomas Stanway, a builder, for refusing to pay the fees arising out of certain work done to three houses in Keithgrove, Shepherd's-bush.

The work consisted of alterations; an extra room having been built on the back additions. The account was disputed on the ground that the District Surveyor, in determining his fees, had included the "area" of the front vaults, defendant contending that, according to sec. 3 of the Act, he was not entitled to do so, as the vaults in question did not exceed the height of the ground story.

The magistrate asked whether, as a matter of fact, this had been done, and the District Surveyor replied that it had, and submitted that the Act entitled him to do so; his dimensions were compared with the defendant's and found to agree. He explained that by sec. 3 "area" was deemed to be the superficies of a horizontal section of such building made at the point of its greatest surface, &c., but this was for the purpose of construction, and limitation of areas (as shown by subsequent sections throughout the Act), and not for District Surveyors' fees: for this purpose, viz., "Fees payable to District Surveyors," the Act provided a distinct schedule, containing a note that "area" shall include the area of any attached building. This had been done, and afterwards one-half the fee in the case of a new building of the same area had been charged. He produced the report of a case decided by Sir James Ingham, where a similar objection had been raised, the magistrate ruling that for the purpose of fees, according to schedule 2, the "area" of any attached building whatsoever must be included.

Mr. Bridge said this case seemed to the point: there was not the slightest doubt in his mind that the front vaults were attached buildings. As to the definition given by sec. 3 of the term "area," that was held by the District Surveyor, and had been laid down by Sir James Ingham, to be superseded by the note at the end of the second schedule. He should follow the view taken by Sir James Ingham, and decide in favour of the District Surveyor.

DAMAGE IN BUILDING.

GARRETT *v.* KIRK AND OTHERS.

THIS was an action brought in the Exchequer Division, before Mr. Justice Hawkins, to recover compensation for injuries sustained by the plaintiff owing to the alleged negligence of the defendants in pulling down and rebuilding the Civil Service Co-operative Stores.

The defendants denied their liability beyond a sum of 5*l.*, which was paid into court.

The plaintiff was a whitesmith and metal merchant, residing in Arundel-place, Haymarket, and the defendants were respectively contractors and dealers in general goods.

It was stated on behalf of the plaintiff that at eight o'clock in the morning of the 20th of October a police inspector rushed into the plaintiff's house and ordered everybody out of the building, as it was on the point of falling down, and some men in the employ of the defendants came in and removed a large quantity of furniture and goods. The alarm was alleged to have been caused by the excavations which the contractors had made for the purpose of rebuilding a part of the stores, which had brought about a subsidence of the ground upon which the plaintiff's house was built. The plaintiff now claimed in respect of loss sustained by removing his business and furniture, and also for the obstruction of light and air by the erection of the new store buildings. The contractors alleged that they had properly shored up the plaintiff's premises, and denied liability, while the Co-operative Society brought 5*l.* into Court as sufficient to meet the plaintiff's claim against them.

The Jury gave a verdict for the plaintiff as against the contractors with 140*l.* damages; and as against the Co-operative Society with 5*l.* damages beyond the sum paid into Court.

Judgment was entered for both amounts, the former with and the latter without costs.

OIL PAINTINGS, OR OLEOGRAPHS?

HARWITZ *v.* DOYLE.

THIS case was before Mr. J. F. Collier, the judge of the Liverpool County Court, the other day. It was an issue sent for trial from the Queen's Bench Division of the High Court of Justice by Mr. Justice Field. The plaintiffs were picture-dealers, carrying on business in London, and the defendant was in the same business at Southport. The action was brought to recover the agreed price of certain pictures sold by the plaintiffs to the defendant, and guaranteed by them to be oil paintings. The defence was substantially that the pictures in question were not oil paintings, as they were represented to be, but were oleographs; in other words, that they were transfers taken from original pictures by photography, printed on paper or canvas, and afterwards "sharpened up" by the painter's brush. A sum of 19*l.* 14s. 6d. had been paid into Court, and the balance of the claim of 31*l.* 14s. 6d. was disputed.

Mr. S. H. Graves appeared for the plaintiffs, and called Mr. Bauer, an artist brought specially from Vienna, to prove that he painted the two pictures produced, and called respectively "Mendicant Monks," originally painted by Schmidt, and "Gossips," by Passini. The witness offered, as a test of the genuineness of his work, to rub out the whole of it by means of turpentine, and stated that if he did so it would leave the canvas almost clean, which would not be the case if the picture were an oleograph. He stated further that it was impossible to produce oleographs on canvas.

Dr. O'Feely, who appeared for the defendant, called Mr. Charles Swan, a picture-dealer, of Mount Pleasant, Liverpool, who examined the picture, and stated that it was not a genuine oil painting, but was an oleograph on canvas, for producing which a process had been invented about two years ago. He proceeded to explain his reasons for his opinion, and said that on holding the picture up to the light the canvas was penetrated by the latter in parts where it would have been impenetrable except in the case of oleographs. The witness produced examples of oleographs on paper, but said he had none on canvas, although he had seen several of them, and they were commonly met with.

On account of the conflict of evidence, the judge, on his own responsibility, sent for Mr. Grindley, a well-known Liverpool picture-dealer, and requested him to express an opinion as to whether the pictures produced were oil paintings or not. Mr. Grindley having replied that they were, his Honour gave judgment for the plaintiffs for the full amount of their claim, with costs.

THE WELLINGTON MONUMENT, ST. PAUL'S.

WE are glad to be able to say that the Wellington Monument is at length completed. As soon as H.M. Office of Works have had the pavement laid in the chapel, the monument will, we believe, be opened to the public.

ARCHITECTURE AT THE PARIS EXHIBITION.

ARCHITECTURAL drawings, photographs, and models intended for the Paris Universal Exhibition will be received at the Western Exhibition Galleries, South Kensington, on Monday, the 18th of February, and three following days.

This arrangement will be communicated by the Commissioners to all who have applied for space by circular. The number of applications is so considerable, and the amount of space applied for is so much in excess of what can possibly be granted to architecture, that the committee of the Institute of Architects who have this matter in hand will have a difficult task to perform in making the selection of those drawings, &c., which will actually be forwarded to Paris.

STANLEY'S FLUID PROFESSIONAL COLOURS.

MR. STANLEY, of Great Turnstile, has essayed another effort for the advantage of architects and engineers; this time it is in the shape of colours already prepared for immediate use. In the well-made box before us there are twelve bottles, each containing the colour, in liquid, for a specific purpose, and labelled accordingly,—"Brickwork in Elevation," "Brickwork in Section," "Concrete," "Earth," and so on. There are two labels especially that should be added,—"Cast Iron" and "Wrought Iron," in these days of iron construction. Having practically tried the colours, we can say they are remarkably good, and dry soon, though not too soon to interfere with satisfactory working. We think the arrangement will meet with the approval of architects and engineers.

SCHOOLS OF ART.

Rotherham.—The prizes to the students of the Rotherham School of Art were distributed the other evening by the Hon. E. Stanhope. At the commencement of the proceedings a letter was read from the mayor, who seems to have taken umbrage at the committee having invited any one but himself to present the prizes or take the chair, and therefore, he wrote, he could not be present "to take the place of a mere townsman only." His absence, however, does not seem to have detracted from the success of the meeting. The annual report of the committee stated that the names of seventy-five students appeared on the register for the past year, and in April last 552 drawings, executed in the school by fifty-three students, were forwarded to the Science and Art Department at South Kensington for examination, and the Department examiners awarded the following prizes to the school:—One free studentship, one silver medal, four third-grade book prizes, eleven second-grade prizes, and two Queen's science prizes. Twenty-two students passed in the second-grade examination, and three in science. There are now sixty students on the register. It is proposed to erect new buildings for the use of the school, as the present accommodation is inadequate. A site has been purchased, but funds are required for the building. The report of the art-master (Mr. G. A. Illston) was then read, and from this it appeared that the school was gradually increasing and advancing its position amongst the schools of art in the country.

Nottingham. — The prizes gained by the students of the Nottingham School of Art were distributed on the 8th ult. by Mr. Justice Mellor. The school, under the head-mastership of Mr. J. S. Rawle, F.S.A., continues to maintain a high position. In the National Competition for 1877, the Nottingham school has taken a greater number of awards than any other in the kingdom. The following are the most successful schools:—Nottingham, 24 awards; South Kensington Head Schools, 19; Lincoln, 18; Bloomsbury (London), 17; Lambeth, 14; Westminster, 14; Manchester, 12; Birmingham, 11; Sheffield, 11; Edinburgh, 9; Dublin, 6; West London, 6; Belfast, 5; Kidderminster, 5; Leicester, 5. Nottingham has taken about one-sixth of the awards given to provincial schools; and one-tenth of the entire number distributed throughout the country to 141 schools of art. The awards obtained by Nottingham in 1877 are greater in number than those ever obtained by any other school in the kingdom, except South Kensington. Nottingham has also gained more advanced third-grade prizes than any school in the kingdom, having obtained one-sixteenth of the entire number awarded. The most successful schools are—Nottingham, 55 awards; South Kensington Head Schools, 43; Birmingham, 33; Sheffield, 29; Edinburgh, 28; Manchester, 28; Lambeth, 25; Kidderminster, 23; Bloomsbury (London), 20; Dublin, 19; Dundee, 19; Lincoln, 19; Belfast, 18; West London, 17; Westminster, 17. In their annual report, the committee express their regret that the South Kensington authorities propose to discontinue the bonus awards to successful art-masters. To quote official Departmental Blue Books, these awards were made to those schools "in which the general amount of work, as tested by examinations was relatively most satisfactory." The Government commenced giving these awards in 1868, but has now determined that no further awards are to be made. The committee regret this decision, as one of the most important tests as to a school's efficiency, and a great incentive to watchful care on the part of the art-masters, are now removed. The head master of the Nottingham School during the nine years in which these awards have been made, has gained a higher amount in bonuses than any other master in the kingdom.

Books Received.

Building Construction: showing the Employment of Timber, Lead, and Iron Work in the Practical Construction of Buildings. By R. SCOTT BURN. London and Glasgow: William Collins, Sons, & Co. 1877.

THIS is the second of Collins's "Advanced Science Series" of books on construction; the first of which is headed "Brickwork and Masonry." The book is handy in size, and contains a great deal of practical information in a small space, and a great many illustrative diagrams, which, however, are rather roughly got up. The sketch-illustrations of iron roof trusses, for example, are hardly what one would expect to find in any volume published in a series with the epithet of "advanced science" appended to it. There is not the remotest indication as to how they are put together, though the general principles and methods of iron joinery, as it may be termed, are separately illustrated. It would be impossible, however, to give all that was needed without raising the book to a prohibitive price; but we complain of its rather pretentious and over-comprehensive title. In the occasional illustrations which touch on ornamental treatment, the book is no better than such books usually are; the barge-boards and other things of the kind shown on pages 66, 67, are miserable; and as the book does not profess to teach design, but only construction, why meddle with design at all? The illustrations of scaffolding seem rather meagre, and the means of putting together are again not indicated. Some of the smaller and most commonplace details are not quite to be depended upon; for instance, the sill and bottom rail of a window, of which the section is given on page 132, would not be weather-tight in a driving rain; the sill ought to be worked with a throating in the solid. One point in the book which we take serious exception to is the amount of space devoted to the illustration of a scamping American way of making timber framing, called the "balloon-frame system," and which simply consists in dispensing altogether with the trouble and expense of halving, mortising, tenoning, or any of the received methods of producing permanent timber construction, and merely butting the timbers together and "side-nailing" them. The author, indeed, uses the grander term of "the diagonal principle" in nailing, but it is only what English workmen have long known and practised as "side nailing" in work the strength of which is not important. To see such a cheap and bad system seriously put forth and recommended in an English book for workmen has a very bad appearance. The amusing part of it is that the author draws special reference (p. 93) to the great strength of the joining between a bearer and an upright figured on that page, observing that the joists resting on the bearer will break in the middle rather than the bearer give way, but overlooks the fact that this is the one point in the system in which the proper method of framing is adopted, and the bearer is let into the upright, and depends on the strength of the wood, and not on the nails; and as on a previous page he says that any cutting or fitting of the timbers is at variance with the principle of the work, this is all the more inconsistent.

THE MASONS' RULES.

SIR,—Mr. H. Nisbet, the Secretary of the Masons' Strike Committee, wrote to the *Times* a few days since a letter in which there is the following amazing statement:—"Any man (a mason) can do as much work as he is able without any interference on the part of the Society." Every one connected with the trade knows, unfortunately, to the contrary. Mr. Nisbet made a similar statement in a daily paper a few weeks since, and was immediately answered by a working mason, who gave him full particulars of his having been heavily fined for doing too much work, or as it is technically called "chasing." Mr. Nisbet could not and did not deny these facts.

But the published rules of the Masons' Union are in contradiction to Mr. H. Nisbet; as, for instance, Rule 8 says working overtime shall be abolished, and where any member works overtime he shall be fined not exceeding 2*l*. The same rule prohibits piece-work or sub-contracting. Rule 9 justifies lodges in resisting the introduction of artificial light.

Your readers will be enabled to judge by these rules of the truth of Mr. H. Nisbet's assertion. A MASTER BUILDER.

DAMP WALLS.

SIR,—A correspondent of yours recommended some waterproof paper for damp walls. I have procured the paper; will some correspondent let me know how it is to be put on? The usual paste and size will not adhere to damp walls. A. P.

ROT.

SIR,—Some few years since a friend of mine built a greenhouse (22 ft. by 13 ft.) on the floor above the ground-floor of his house. The joists and flooring were precisely similar to those put in the other portions of the house, and on the flooring were laid ordinary red brick tiles, 12 in. square by 1½ in. thick. The floor was laid level, and no drain was put to carry off water. Upon taking up one of the tiles, which had fallen in at one end; a short time since I was concerned to find that the flooring underneath it had become perfectly rotten; and this appears to be the case all over the greenhouse. Of course the tiles and flooring will have to be taken up, and I am desirous of knowing what should be done to prevent a recurrence of such a mishap, and what sort of floor should be laid. If any of your readers would advise me I should be much obliged. QUERIST.

P.S.—Between the tiles and the flooring there appears to have been cement and sand, but, I should think, a very small proportion of the former; for it has not formed a solid mass, but is quite loose like sand.

Miscellanea.

Ferrumite Paving.—At a meeting of the Alverstoke Local Board on the 17th ult., the roads and works committee recommended that the ferrumite paving be laid in Stoke and Forton roads, and the streets adjoining, and that such Ferrumite be manufactured at least three months before use. Mr. Mumby said the committee had considered three materials—York paving, Purbeck stone, and ferrumite. If it had not been for the cost the committee would have recommended York paving. With regard to the ferrumite, they had not had a very large experience; but some had been laid down at Portsmouth, where the traffic was very heavy, for some years, and wore exceedingly well. They had had a sample at Gosport for nearly twelve months, and one of the squares which had been taken up showed no perceptible wear. Some marks which had been scratched on the stone by the surveyor in March last, when the stone was laid, still remained, thus showing that the wearing had been very small. The York and Purbeck paving were much more worn. The ferrumite was much cheaper, therefore, not only on the score of durability, but in first cost, as it was only about 5s. 8d. a square yard, against 6s. 9d. and 10s. 6d. in Purbeck and York paving. But over and above the saving which would be effected financially, the committee, with one exception, agreed that it was very much the best material to use, because it was harder, better to look at, pleasanter to walk on, and in every possible point they considered the ferrumite was to be preferred. The surveyor's report on the subject bore out these statements, and the report was adopted.

The Kensington Surveyor. — The Kensington Vestry have raised the salary of their surveyor, Mr. William Weaver, 100*l*. per annum. We record it with pleasure, knowing Mr. Weaver to be not only an energetic officer, but most courteous and obliging to those who have occasion to apply to him on his branch of parish business.

Case under the Emyloyers and Workmen Act.—At Lambeth Police Court, Mr. Chance has given his decision in a case in which a question of some interest was raised under the Employers and Workmen Act. Two journeymen carpenters, named Woodhead and Toby, summoned Mr. William Smith, builder, of Lower Kennington-lane, for wages. According to the statement of complainants they were engaged to go to Edenbridge, Kent, to work, and they were to be paid London full time,—9d. per hour. When they got to Edenbridge they had to seek for lodgings, which occupied them the whole day, for which they charged working time. They were to have London wages, and lodging and railway fare. They worked some hours on the three following days, when a dispute arose, and they came to town. They demanded the full time, as also the railway fare and money for lodgings. The claim was resisted on the ground that very little work had been done by the complainants on the buildings, and it could not be tolerated that men were to waste a whole day looking for lodgings, and then charge the same sum as if they had worked. After a very lengthened hearing, Mr. Chance declined to give the full amount of the claim, on the ground that more actual work might have been done by complainants, and considered they had lost two half-days. He took occasion to remark that such disputes would be avoided if parties made proper agreements when they arranged for work. He made an order in each case of 1*l*. 0s. 9d., and 12s. costs.

Burns Monument for Dumfries.—The *Scotsman* says it has been resolved to take steps for the erection of a monument commemorative of Robert Burns's intimate connexion with the good town of Dumfries. The committee charged with the prosecution of the undertaking have made a choice of a design by Mrs. D. O. Hill, Edinburgh, worked out, so far, only in the form of a small model. The framework, so to speak, of the composition consists of a composite pedestal, intended to stand 13 ft. high, the central part of which would be square in form. In each side is a panel, which may, if thought desirable, receive a bas-relief; and at each of the four corners there is carried up to the height of 4 ft. from the ground a projecting shaft, of square section, designed to support a symbolic figure. The statue of Burns, which will occupy the summit of the pedestal, is proposed to be cast in bronze, of the height of 8 ft. Of the subsidiary figures, which are intended to be of life size, and will be executed in bronze or stone, one is designed to represent the genius of Poesy. Another will be representative of Religion. Patriotism is symbolised by a figure in belted plaid and shirt of mail, grasping a sword in the right hand and resting the left on an ample shield; while in the joyous peasant with her reaping-hook is suggested the type of healthy rustic beauty which inspired so many of Burns's exquisite lyrics. In the event of basreliefs being added, these will embrace designs illustrative of the "Cottar's Saturday Night," "Tam o' Shanter," and possibly the "Jolly Beggars." For the execution of the monument the sum of 3,000*l*. is required.

Universal Catalogue of Printed Books.—His Royal Highness the Prince of Wales, president of the Society of Arts, has referred to the council the subject of the cost of producing a universal catalogue of all books printed in the United Kingdom up to the year 1600. This idea originated with Mr. Dilke (grandfather of the present baronet), who published it in the *Athenæum* of the 11th of May, 1850. It was brought to the notice of the Society of Arts as far back as December, 1852; and two years ago, just before the Prince of Wales started for India, a printed specimen of such a catalogue was submitted to his Royal Highness. The council of the Society, being desirous of collecting information to enable them to report to their president, have addressed various questions to librarians, publishers, and printers, and invited replies on or before the 15th inst.

Pure Water for Swindon.—The report of the directors of the Swindon Waterworks Company, to be submitted to a general meeting on the 4th inst., contains the following passage:—

"Your directors have entered into a contract with Mr. J. H. Porter, C.E., to apply his patent for the purification and filtration of water (known as the 'Porter-Clark' process) to the water of the company so as to filter and partially soften it. This will be attended with considerable expense; but your directors feel that, having the supply of this increasing town under their control, it is their duty and their best policy to give the inhabitants the purest water in their power."

The Late Dr. Doran, F.S.A.—With extreme sorrow we hear of the death of Dr. John Doran; he expired on the 25th ult., in his seventy-first year, after an illness of three days only. A week before, we had quoted a paragraph from his last work, "London in the Jacobite Times," and had been listening in person to a discussion between him and the author of the "Cyclopædia of Costume" as to the early history of Harlequin, when the remarkable memory of both in matters connected with the stage was strikingly shown. Dr. Doran was the author of a long range of books, and of innumerable contributions to periodical works; he was, moreover, the editor of *Notes and Queries*. An agreeable sketch of the early history of the *Athenæum*, sent by him to that journal a fortnight ago, has been quoted in many quarters. He was a most estimable man and a delightful companion. In many circles his presence will long be sorely missed.

International Scales for Drawings.—Mr. Edwin Lawrence recently wrote to the *Times*:—"It may be valuable to those of your readers who intend to exhibit plans or models at the Paris Exhibition to know that these can be made to a scale capable of being expressed in any language. The only common measures between English feet and inches and foreign decimal scales are the numbers 2 and 10, so the only possible international scales are the following:—Full size = grandeur naturelle; half full size, or 6 in. = 1 ft. = la moitié, ou ·5; quarter full size, or 3 in. = 1 ft. = le quart, ou ·25; 1½ in. = 1 ft. = ·125; ¾ in. = 1 ft. = ·0625. Or 1-10th of any of the above,—viz.: 12-10 in. = 1 ft. = ·1; 6-10 in. = 1 ft. ·05; 3-10 in. = 1 ft. = ·025; 3-20 in. = 1 ft. = ·0125; 3-40 in. = 1 ft. = ·00625. A drawing has only to be made of any of these scales, and marked with the English words, and the corresponding decimal will be understood all over the world."

Technical Education.—The Goldsmiths' Company, with a view to the encouragement of technical education in the design and execution of works of art in the precious metals, have renewed their offer of an annual prize of 50*l*. for the best design, and also 50*l*. for the best model of some article in gold and silver, which, when manufactured, shall exceed 30 ounces in weight; an annual prize of 25*l*. for the best execution and workmanship of some such article; three prizes of 25*l*. each for the best design, model, and execution of some article of less weight than 30 ounces; and prizes of 25*l*. each for the best specimens of chasing or *repoussé* work and engraving.

A Pleasing Occurrence took place on Saturday last, when Mr. W. Richardson, of the firm of Richardson, Ellson, & Co., art metal workers, London and Coventry, was presented by the *employés* of the London house with a valuable timepiece and a handsomely bound copy of Wey's "Rome" on the occasion of his fiftieth birthday.

TENDERS

For alterations and additions to the Crown Tavern, Brewer-street, Golden-square, for Mr. Crack. Mr. J. Jewhurst, architect:—

Stamp & Bowtie	£1,936 0 0
Simpson	1,337 0 0
Batley	1,294 0 0
Gibbon & Mitchell	1,190 0 0
Jackson & Todd	1,145 10 0

For dining-hall in connexion with the Boys' School, Cambridge. Mr. Robert Curwen, jun., architect. Quantities supplied by Mr. J. S. Alder:—

Kirk & Randal	£3,864 0 0
Brass	3,850 0 0
Higgs & Hill	3,690 0 0
Dove, Bros.	3,627 0 0
L. H. & R. Roberts	3,555 10 0
Perry & Co.	3,420 0 0
H. & S. Pattinson	3,298 0 0
Bell & Sons	3,208 0 0
Denson	3,190 0 0

Accepted for a building at Altrincham, Cheshire, for Mr. W. Cunliffe Brooks, M.P., to be used as the new post-office. Mr. George Truefitt, architect:—

Bricklayer's Work.	
Hamilton	£818 10 0
Joiner's Work.	
Cross & Bell	700 0 0
Stonework.	
Patteson	592 10 0
Plumber's Work.	
Walton	332 0 0
Plastering and Painting.	
Owen	140 0 0
Tiling.	
Ashcroft	111 6 6

For Basingstoke Sewerage Works, for the Town Council. Mr. W. F. Rowell, engineer:—

Small & Son (accepted)	£12,902 0 0

For stables at the rear of No. 32, Belsize Park, Hampstead, for Mr. J. F. Huggins. Mr. John Pugh, architect; Mr. J. Glenn, surveyor:—

Larter & Son	£669	0	0
Thomas & Son	661	5	0
Kerry	640	11	6
Julian & Co.	621	0	0
Whiteley	597	10	0

For erecting new cart-sheds for the Kensington Vestry:—

Taylor & Co.	£605	0	0
Hockley	595	0	0
Mears	590	0	0
Lathey, Bros.	583	0	0
Thorn	577	0	0

For rebuilding premises, 102 and 104, Seymour-street, for Mr. J. Elvidge. Messrs. J. Saville & Son, architects:—

Fawkes	£2,867	0	0
L. H. & R. Roberts	2,597	0	0
Campion (too late)	2,499	0	0
Manley & Rogers	2,297	0	0
Scrivener & White	2,287	0	0
Temple & Forster	2,247	0	0
Nightingale	2,237	0	0
Braid & Co. (accepted)	2,229	0	0
Wild	2,010	0	0

For alterations and additions to Turkish baths, Caledonian-road, for Mr. J. Johnson. Messrs. J. Saville & Son, architects:—

Temple & Forster	£929	10	0

For alterations and repairs to 19B, Grosvenor-square, for Mr. C. Waring. Messrs. J. Saville & Son, architects:—

General Works.

Temple & Forster	£1,057	0	0

Engineer's Works.

Adams & Son	398	0	0

For house on the Holloway Estate, Dorking, for Mr. J. W. Sugg. Mr. Dibble, architect:—

Colls & Son	£1,957	0	0
Edser	1,880	0	0
Goddard & Sons	1,830	0	0
Heselgrave	1,769	0	0
Hamblin, Bros.	1,668	0	0

For building Alexandra Schools, Penge, Surrey, for the Beckenham School Board. Mr. A. R. Stenning, architect. Quantities by Messrs. Linsdell & Giffard:—

Niblett	£10,019	0	0
Lee & Wotton	9,966	10	0
Sabey & Son	9,600	0	0
Staines & Son	8,964	0	0
Bayes, Bros., & Allen	8,750	0	0
Sheffield & Prebble	8,557	0	0
Parker & Evans	8,506	0	0
Tongue	8,299	0	0
Josolyne (accepted)	7,855	0	0
Vincent	7,660	0	0

For Bromley-road Schools:—

Lee & Wotton	£773	0	0
Niblett	749	0	0
Bayes, Bros., & Allen	718	0	0
Staines & Son	696	0	0
Taylor & Co.	682	0	0
Hudson	650	0	0
Waugh	649	0	0
Parker & Evans	630	0	0
Josolyne	597	0	0
Prebble	583	0	0
Vincent (accepted)	580	0	0

For the construction of steam engines and other cast-iron work, at Basingstoke, for the Town Council. Mr. W. F. Rowell, engineer:—

Laidlaw & Sons (accepted)	£4,023	0	0

In the list of tenders for Messrs. Weeks & Hughes, in the place of "Ede & Motley," read "Eede & Notley."

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N.B.—The above machine may be used either as an exhauster or injector, as may be preferred, or both objects combined.
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